NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

REPORT No. 244

AERODYNAMIC CHARACTERISTICS OF AIRFOILS—IV

By

NATIONAL ADVISORY COMMITTEE
FOR AERONAUTICS

REPRINT OF REPORT No. 244, ORIGINALLY PUBLISHED SEPTEMBER, 1926

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1927

AERONAUTICAL SYMBOLS

1. FUNDAMENTAL AND DERIVED UNITS

	Symbol	Metric		English	
		Unit	Symbol	Unit	Symbol
Length	l	meter	m	foot (or mile)	ft. (or mi.)
Time	t	second	sec	second (or hour)	sec. (or hr.)
Force	F	weight of one kilogram	kg	weight of one pound	lb.
Power	P	kg/m/sec		horsepower	HP.
Speed		km/hr		mi./hr	M. P. H.
		m/sec		ft./sec	f. p. s.

2. GENERAL SYMBOLS, ETC.

W, Weight, $=mg$

g, Standard acceleration of gravity $=9.80665$ m/sec.$^2=32.1740$ ft./sec.^{2}

m, Mass, $=\frac{W}{g}$

ρ, Density (mass per unit volume).

Standard density of dry air, 0.12497 (kg-m^{-4} sec.^{2}) at 15° C and 760 mm $=0.002378$ (lb.-ft.$^{-4}$ sec.^{2}).

Specific weight of "standard" air, 1.2255 kg/m$^3=0.07651$ lb./ft.^{3}

mk^2, Moment of inertia (indicate axis of the radius of gyration, k, by proper subscript).

S, Area.

S_w, Wing area, etc.

G, Gap.

b, Span.

c, Chord length.

b/c, Aspect ratio.

f, Distance from $c.\ g.$ to elevator hinge.

μ, Coefficient of viscosity.

3. AERODYNAMICAL SYMBOLS

V, True air speed.

q, Dynamic (or impact) pressure $=\frac{1}{2}\rho V^2$

L, Lift, absolute coefficient $C_L=\frac{L}{qS}$

D, Drag, absolute coefficient $C_D=\frac{D}{qS}$

C, Cross-wind force, absolute coefficient $C_C=\frac{C}{qS}$

R, Resultant force. (Note that these coefficients are twice as large as the old coefficients L_C, D_C.)

i_w Angle of setting of wings (relative to thrust line).

i_t, Angle of stabilizer setting with reference to to thrust line.

γ, Dihedral angle.

$\rho\frac{Vl}{\mu}$, Reynolds Number, where l is a linear dimension.

e. g., for a model airfoil 3 in. chord, 100 mi./hr. normal pressure, 0° C: 255,000 and at 15° C., 230,000;

or for a model of 10 cm chord 40 m/sec, corresponding numbers are 299,000 and 270,000.

C_p, Center of pressure coefficient (ratio of distance of $C.\ P.$ from leading edge to chord length).

β, Angle of stabilizer setting with reference to lower wing, $=(i_t-i_w)$.

α, Angle of attack.

ϵ, Angle of downwash.

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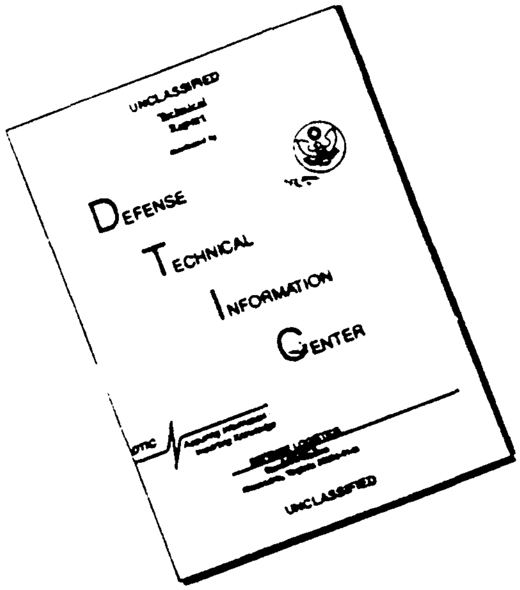

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AERODYNAMIC CHARACTERISTICS OF AIRFOILS—IV

CONTINUATION OF REPORTS NOS. 93, 124, AND 182

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INTRODUCTION

This collection of data on airfoils has been made from the published reports of a number of the leading aerodynamic laboratories of this country and Europe.[1] The information which was originally expressed according to the different customs of the several laboratories is here presented in a uniform series of charts and tables suitable for the use of designing engineers and for purposes of general reference.

It is a well-known fact that the results obtained in different laboratories, because of their individual methods of testing, are not strictly comparable even if proper scale corrections for size of model and speed of test are supplied. It is, therefore, unwise to compare too closely the coefficients of two wing sections tested in different laboratories. Tests of different wing sections from the same source, however, may be relied on to give true relative values.

The series of airfoils designated N. A. C. A.–M1 to N. A. C. A.–M27 (Reference Nos. 506 to 532) were tested in the variable density wind tunnel of the National Advisory Committee for Aeronautics at a pressure of approximately 20 atmospheres.

The *absolute system of coefficients* has been used, since it is thought by the National Advisory Committee for Aeronautics that this system is the one most suited for international use and yet it is one from which a desired transformation can be easily made. For this purpose a set of transformation constants is given.

Each airfoil section is given a reference number, and the test data are presented in the form of curves from which the coefficients can be read with sufficient accuracy for designing purposes. The dimensions of the profile of each section are given at various stations along the chord in per cent of the chord, the latter also serving as the datum line. When two sets of ordinates are necessary, on account of taper in chord or ordinate, those for the maximum section (at center of span) are given on the individual characteristic sheets, while those for the tip (dotted) section are given in separate tables, page 226. Where the ratio of ordinate to chord remains constant the one set of ordinates applies to both center and tip section. The shape of the section is also shown with reasonable accuracy to enable one to more clearly visualize the section under consideration, together with its characteristics.

The authority for the results here presented is given as the name of the laboratory at which the experiments were conducted, with the size of model, wind velocity, and year of test.

TRANSFORMATION CONSTANTS

For the convenience of those who prefer to use a system of units other than the absolute system, there is given below a table of transformation constants based on the standard condition adopted by the National Advisory Committee for Aeronautics of—

Temperature	= 15.6° C.	= 60.1° F.
Pressure	= 760 mm Hg.	= 29.92 in. Hg.
Humidity	= 0.	
Gravity	= 9.806 m/sec.^{2}	= 32.172 ft./sec.^{2}

[1] A previous collection of airfoil sections 1 to 503 and charts 1 to 12 may be found in N. A. C. A. Reports Nos. 93, 124, and 182.

thus giving values of specific weight of air

$$W = 1.223 \text{ kg/m}^3 = 0.07635 \text{ lb./ft.}^3$$

and of density

ρ = 0.1247 in the French engineering or kilogram, meter, second system.

Or

= 0.00237 in the English or pound, foot, second system.

In absolute units	$P = CV^2\rho/2$
In kg/m^2 (m/sec.)	$P = .0625\ CV^2$
In kg/m^2 (km/hr.)	$P = .004822\ CV^2$
In lb./sq. ft. (ft./sec.)	$P = .001189\ CV^2$
In lb./sq. ft. (mi./hr.)	$P = .002558\ CV^2$

Note that these constants are half as large as those used in Reports Nos. 93 and 124 and that the absolute coefficients used in this report are twice as large as the old coefficients. See Report No. 240 regarding change in absolute coefficients.)

INDEX

Three separate types of index are given—chart indexes which make it possible for a designer to select the wing section most suitable for the particular design in which he is interested; a group index which is arranged by countries and laboratories at which tests were conducted, each section also being designated by a reference number; and an alphabetical index.

CHART INDEX

In order that the designer may easily pick out a wing section which is suited to the type of airplane on which he is working, four index charts are given which classify the wings according to their aerodynamic and structural properties. In the charts of this report a lower-case letter is placed adjacent to the reference number giving Vl values, so that a comparison can be made without referring to the individual drawings. In this value V represents wind velocity in feet per second and l a linear dimension, the chord, in feet.

In chart No. 13 the minimum drag, C_D is plotted against the L/D at one-fourth the maximum lift, C_L. This chart should be used in choosing a wing section for a high-speed airplane, the wing sections being more suited for this use the farther they are from the lower left-hand corner.

In chart No. 14 the mean spar depth is plotted against the maximum lift, C_L in order to show the possible strength and lightness of the wing structure. The higher the maximum lift coefficient is the smaller will be the wing area and the lighter the structural weight, and in the same way the greater the depth of the spars the lighter will be their weight, so that the sections the greatest distance from the lower left-hand corner will give the lightest and strongest wings. The "mean spar depth" is obtained by assuming the spars to be located respectively at 15 and 60 per cent of the chord, and by dividing the sum of their thicknesses by 2. In the case of sections tapered in ordinate, or chord, or both, the mean spar depth of the maximum section (section at center of span) is taken in per cent of the constant chord for the ordinate taper, and of the mean chord for the chord taper although accompanied, in certain airfoils, with an ordinate taper.

In chart No. 15 the maximum L/D is plotted against the maximum lift, C_L, which is of use in choosing the wing section for a slow and efficient airplane. In the same way as before the sections farthest from the lower left-hand corner are the best for this purpose.

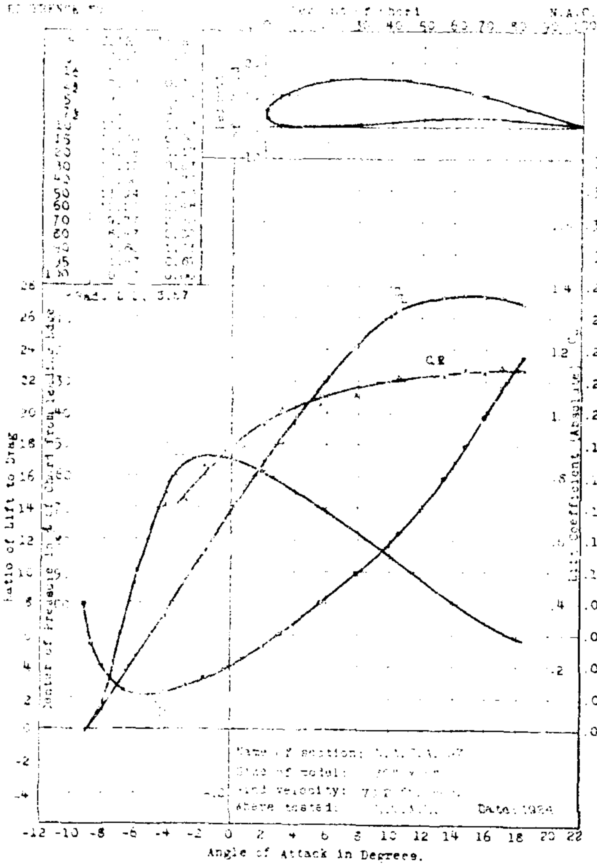
In chart No. 16 the L/D at two-thirds the maximum lift, C_L is plotted against the maximum lift, C_L. This chart can be used for choosing a section that will give an efficient climb or a long range at cruising speed. The best sections for this purpose will be farthest from the lower left-hand corner of the chart.

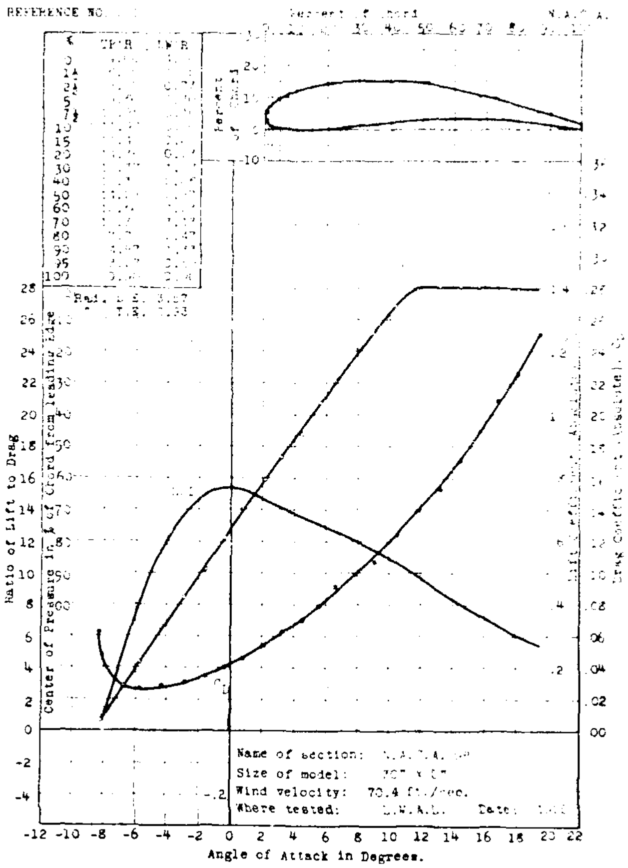
CHART INDEX

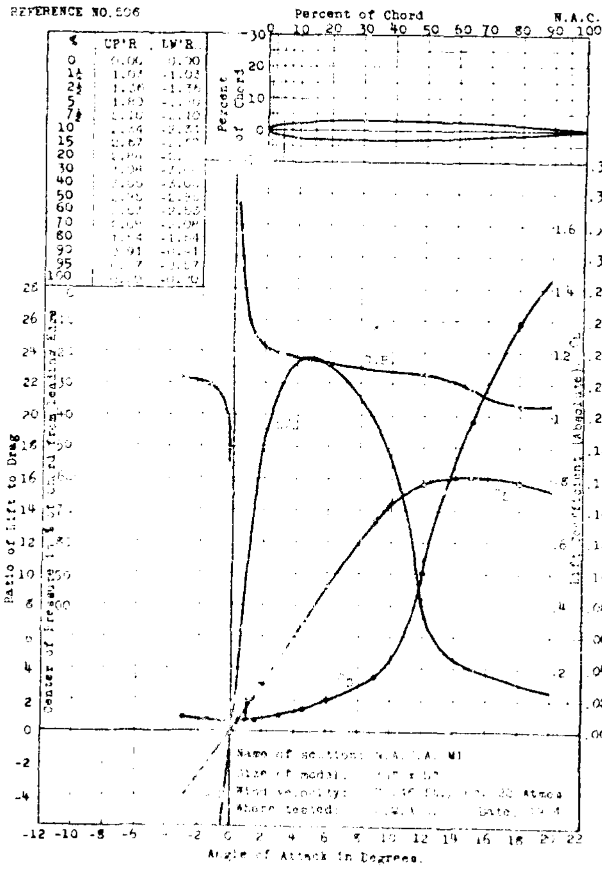
GROUP INDEX

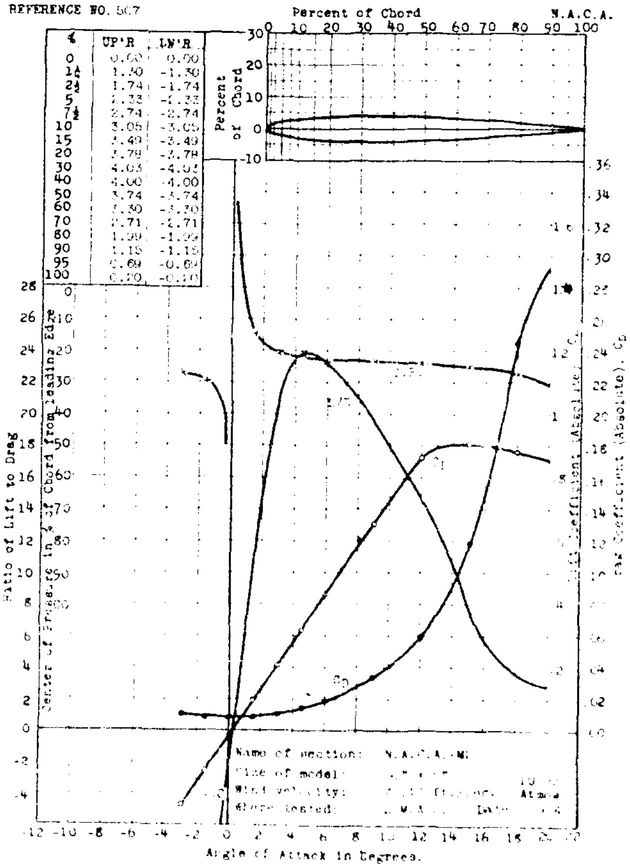
Airfoil	Wind tunnel	Report reference number
UNITED STATES		
N. A. C. A. 97	L. M. A. L.	504
N. A. C. A. 98	do	505
N. A. C. A.-M1	do	506
N. A. C. A.-M2	do	507
N. A. C. A.-M3	do	508
N. A. C. A.-M4	do	509
N. A. C. A.-M5	do	510
N. A. C. A.-M6	do	511
N. A. C. A.-M7	do	512
N. A. C. A.-M8	do	513
N. A. C. A.-M9	do	514
N. A. C. A.-M10	do	515
N. A. C. A.-M11	do	516
N. A. C. A.-M12	do	517
N. A. C. A.-M13	do	518
N. A. C. A.-M14	do	519
N. A. C. A.-M15	do	520
N. A. C. A.-M16	do	521
N. A. C. A.-M17	do	522
N. A. C. A.-M18	do	523
N. A. C. A.-M19	do	524
N. A. C. A.-M20	do	525
N. A. C. A.-M21	do	526
N. A. C. A.-M22	do	527
N. A. C. A.-M23	do	528
N. A. C. A.-M24	do	529
N. A. C. A.-M25	do	530
N. A. C. A.-M26	do	531
N. A. C. A.-M27	do	532
U. S. A. 5	do	533
U. S. A. 27	do	534
U. S. A. 35A	do	535
U. S. A. 35B	do	536
U. S. A. 27 with ordinates decreased 10 per cent	W. N. Y.	539
Albatross (Modified) A	do	540
Albatross (Modified) B	do	541
C-62	do	542
TX	do	543
D-2 (Modified M-80)	do	544
Göttingen 387 (Tapered)	do	545
N. W.	do	546
Dayton-Wright T-1	do	547
Dayton-Wright T-1 (Tapered)	do	548
NS-1	do	549
DW-9	do	550
N-6	do	551
N-7	do	552
N-8	do	553
N-9	do	554
N-10	do	555
N-11	do	556
N-12	do	557
N-13	do	558
N-14	do	559
N-15	do	560
N-16	do	561
N-17	do	562
N-18	do	563
N-19	do	564
N-20	do	565
Sloane (Modified)	do	566
U. S. A. 40	McC F.	567
U. S. A. 41	do	568
U. S. A. 46	do	569
U. S. A. 48	do	570
U. S. A. 49	McC F.	571
U. S. A. 50	do	572
U. S. A. 51	do	573
R-3	do	574
Glenn Martin 2 (Modified)	M. I. T.	575
Dayton-Wright 5	do	576
Dayton-Wright 6	do	577
U. S. A. 35	do	578
U. S. A. 40B	do	579
U. S. A. 45	do	580
Clark V	do	581
Clark W	do	582
Clark X	do	583
Clark Y	do	584
Clark Z	do	585
C-27	do	586
Halbronn 1-A	do	587
Hill 85-15	do	588
Glenn Martin 7	Göttingen	589
Glenn Martin 9	do	590
Glenn Martin 11	do	591
Glenn Martin 13	do	592
Glenn Martin 15	do	593
Glenn Martin 16	do	594
Glenn Martin 17	do	595
Glenn Martin 18	do	596
Glenn Martin 19	do	597
Glenn Martin 20	do	598
Glenn Martin 21	do	599
GREAT BRITAIN		
Fage & Howard A	N. P. L.	600
Fage & Howard B	do	601
Fage & Howard C	do	602
Fage & Howard D	do	603
Fage & Howard E	do	604
Fage & Howard F	do	605
R. A. F. 15	L. M. A. L.	537
R. A. F. 30	R. A. E.	606
R. A. F. 31	do	607
R. A. F. 32	do	608
R. A. F. 33	do	609
GERMANY		
Göttingen 274 (Daimler V)	Göttingen	610
Göttingen 275 (Daimler VI)	do	611
Göttingen 276 (Daimler VII)	do	612
Göttingen 279 (Daimler X)	do	613
Göttingen 280 (Daimler XI)	do	614
Göttingen 282 (Daimler XIII)	do	615
Göttingen 308 (M. V. A. H. 40)	do	616
Göttingen 309 (M. V. A. H. 41)	do	617
Göttingen 310 (M. V. A. H. 42)	do	618
Göttingen 314 (Hansa-Brandenburg).	do	619
Göttingen 315 (Hansa-Brandenburg III.5).	do	620
Göttingen 316 (Hansa-Brandenburg IV.5).	do	621
Göttingen 318 (Hansa-Brandenburg VI.5).	do	622
Göttingen 326 (Pfalz 55)	do	623
Göttingen 387	L. M. A. L.	538

ALPHABETICAL INDEX


N.A.C.A.
Rad. L.E. 3.67
C.P.
C_p
Ratio of Lift to Drag
Center of Pressure in % of Chord from Leading Edge
Lift Coefficient (Absolute), C_L
Drag Coefficient (Absolute), C_D
Angle of Attack in Degrees.


REFERENCE NO.
Percent of Chord
N.A.C.A.
UP'R
LW'R
Rad. L.E. 3.67
Name of section:
Size of model:
Wind velocity: 70.4 ft./sec.
Where tested:
Date:
Ratio of Lift to Drag
Center of Pressure in % of Chord from Leading Edge
Angle of Attack in Degrees.


REFERENCE NO. 506
Percent of Chord
N.A.C.A.
%
UP'R
LW'R
C.P.
C_p
Name of section: N.A.C.A. M1
Where tested:
Ratio of Lift to Drag
Center of Pressure in % of Chord from Leading Edge
Drag Coefficient (Absolute), C_D
Angle of Attack in Degrees.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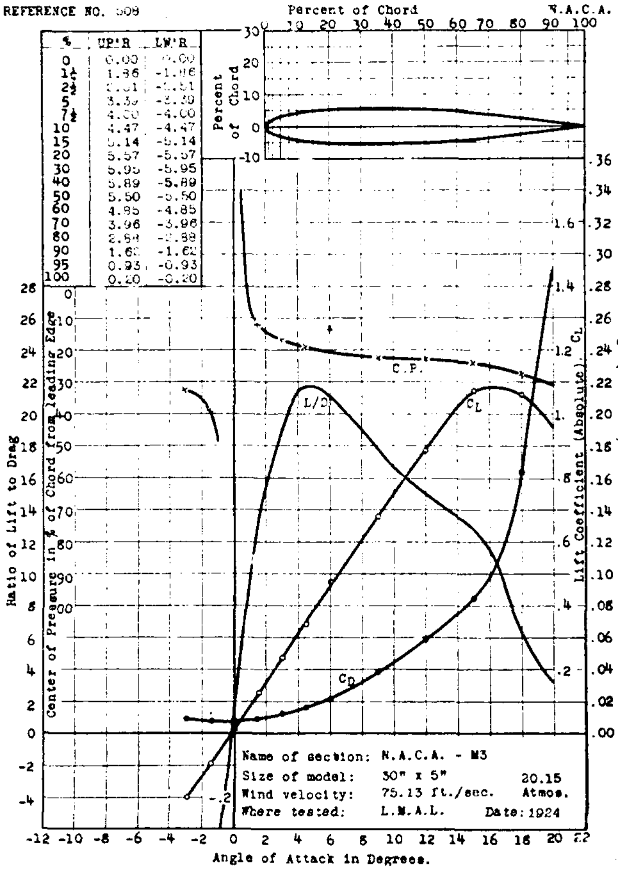
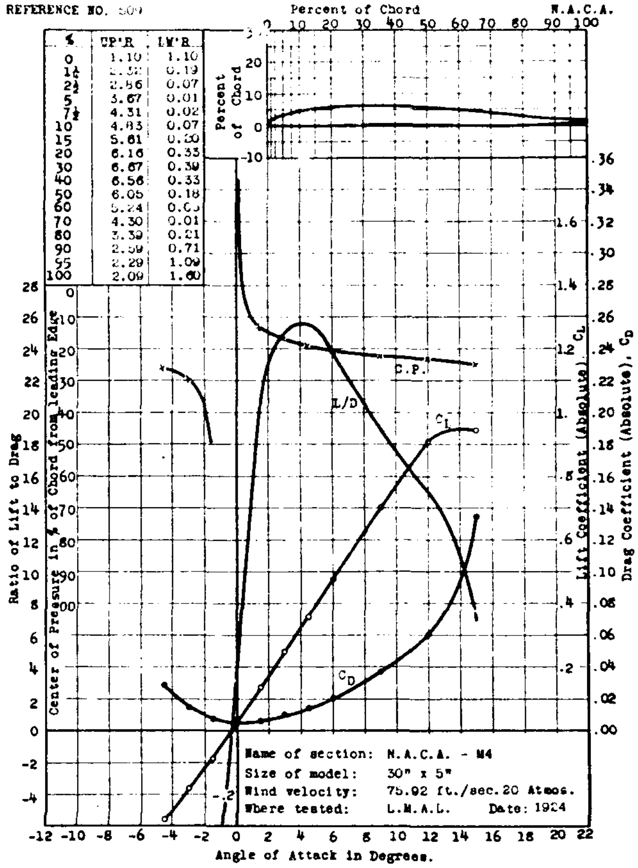
Percent of Chord
N.A.C.A.
%
UP'R
LW'R
0 0.00 0.00
1¼ 1.30 -1.30
2½ 1.74 -1.74
7½ 2.74 -2.74
10 3.05 -3.05
30 4.03 -4.03
40 4.00 -4.00
50 3.74 -3.74
70 2.71 -2.71
90 1.15 -1.15
95 0.69 -0.69
Name of section: N.A.C.A. M1
Size of model:
Wind velocity:
Where tested:
Date:
C_p
Ratio of Lift to Drag
Center of Pressure in % of Chord from Leading Edge
Angle of Attack in Degrees.

REFERENCE NO. 508



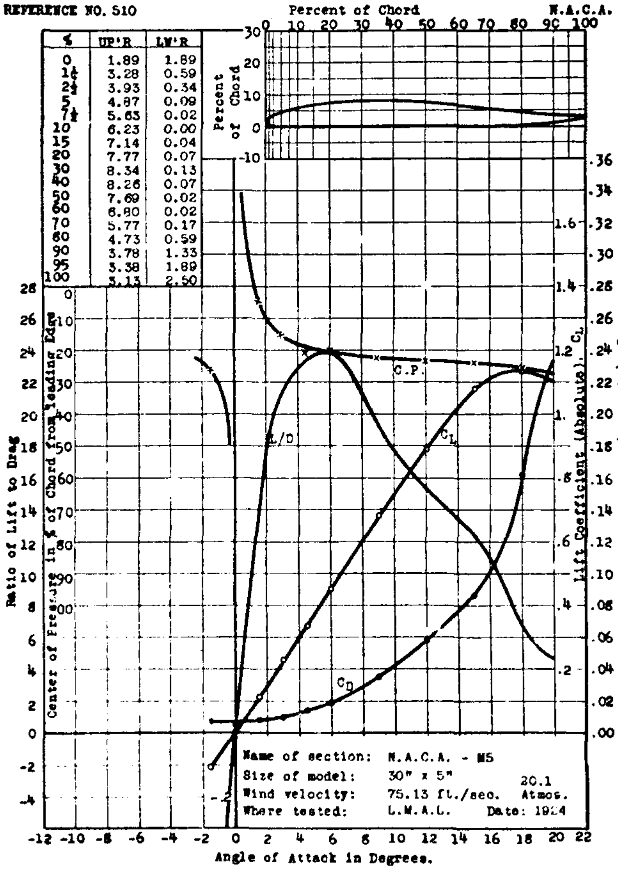
%	UP'R	LW'R
0	0.00	0.00
1¼	1.36	-1.86
2½	2.51	-2.51
5	3.39	-3.39
7½	4.00	-4.00
10	4.47	-4.47
15	5.14	-5.14
20	5.57	-5.57
30	5.95	-5.95
40	5.89	-5.89
50	5.50	-5.50
60	4.85	-4.85
70	3.96	-3.96
80	2.88	-2.88
90	1.62	-1.62
95	0.93	-0.93
100	0.20	-0.20

REFERENCE NO. 509



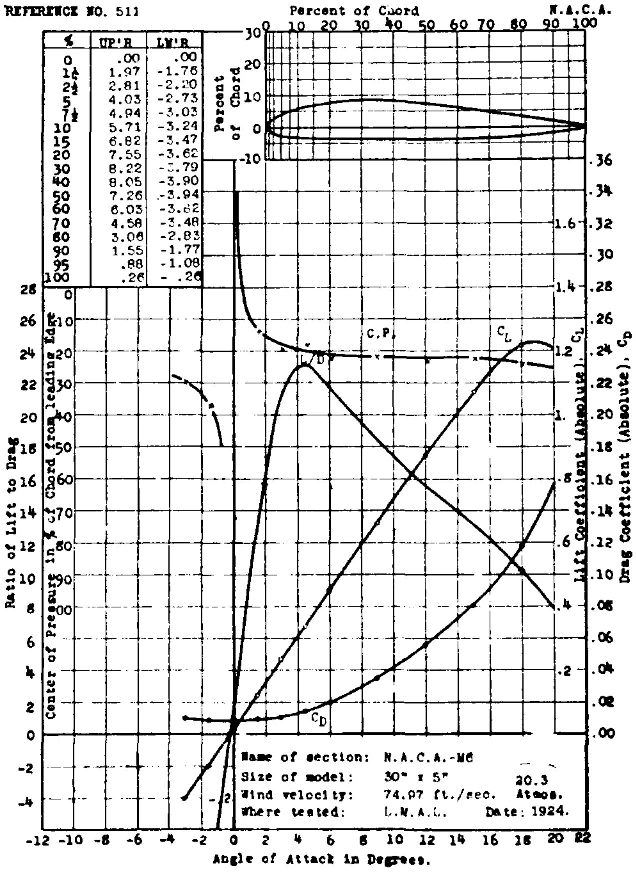
%	UP'R	LW'R
0	1.10	1.10
1¼	2.52	0.19
2½	2.86	0.07
5	3.67	0.01
7½	4.31	0.02
10	4.83	0.07
15	5.61	0.20
20	6.16	0.33
30	6.67	0.39
40	6.56	0.33
50	6.05	0.18
60	5.24	0.05
70	4.30	0.01
80	3.39	0.21
90	2.59	0.71
95	2.29	1.09
100	2.09	1.60

REFERENCE NO. 510

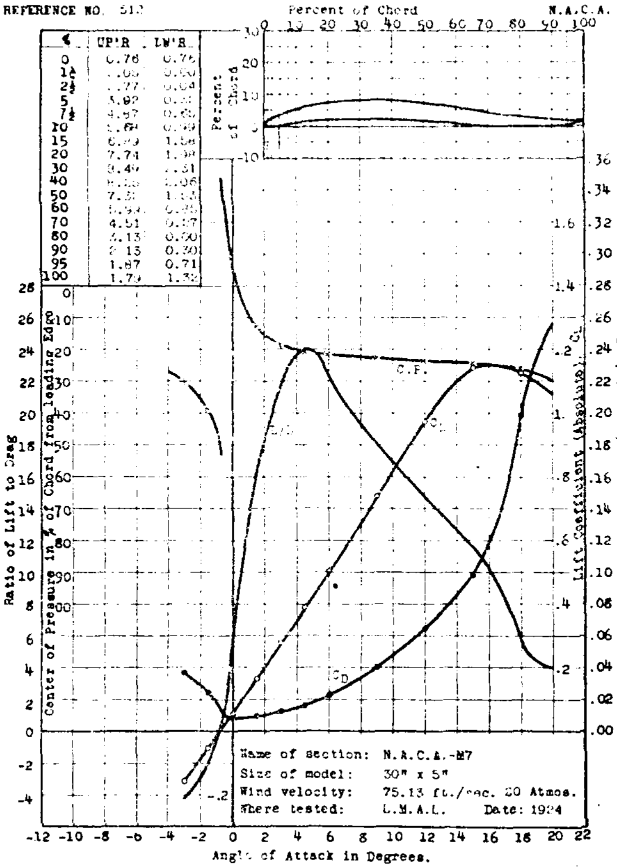


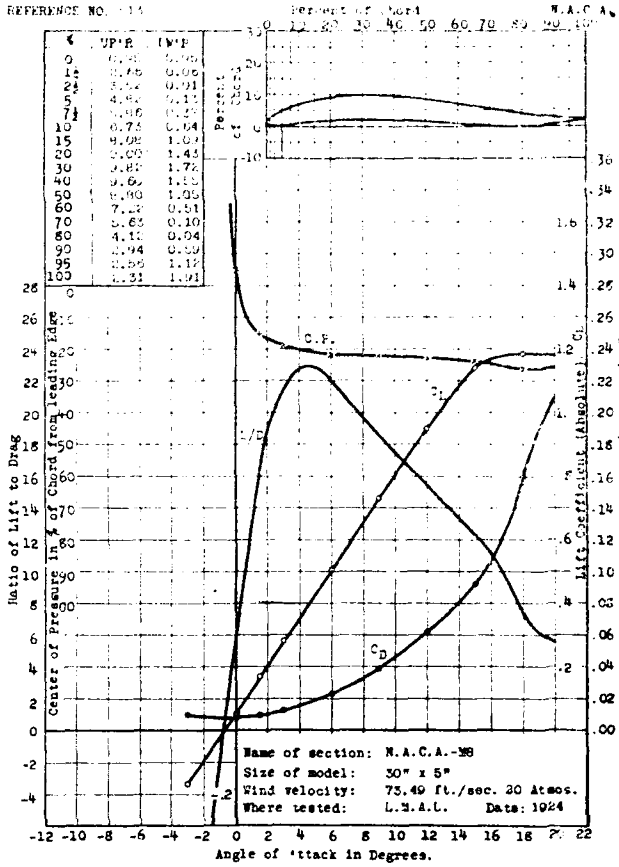
%	UP'R	LW'R
0	1.89	1.89
1¼	3.28	0.59
2½	3.93	0.34
5	4.87	0.09
7½	5.63	0.02
10	6.23	0.00
15	7.14	0.04
20	7.77	0.07
30	8.34	0.13
40	8.26	0.07
50	7.69	0.02
60	6.80	0.02
70	5.77	0.17
80	4.73	0.59
90	3.78	1.33
95	3.38	1.89
100	3.13	2.50

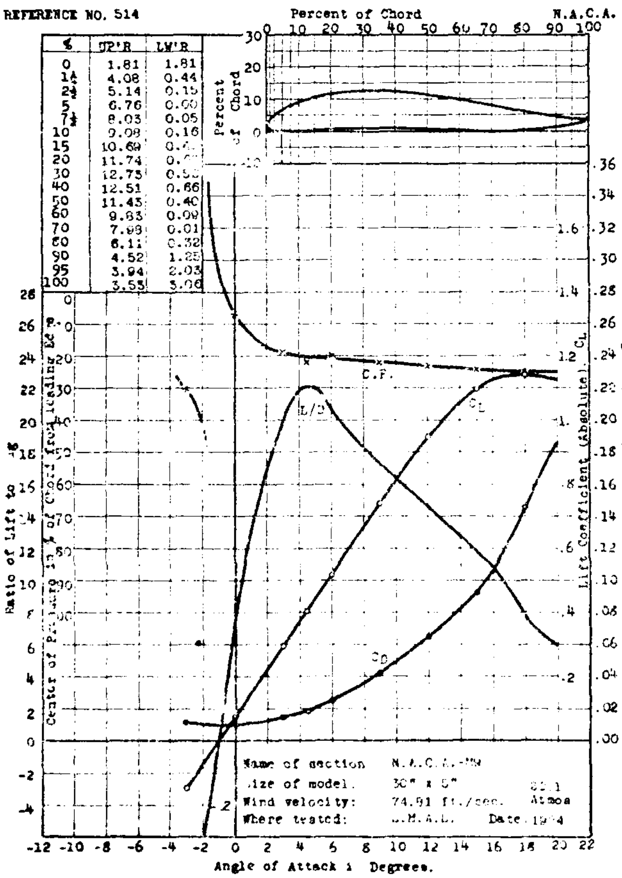
REFERENCE NO. 511

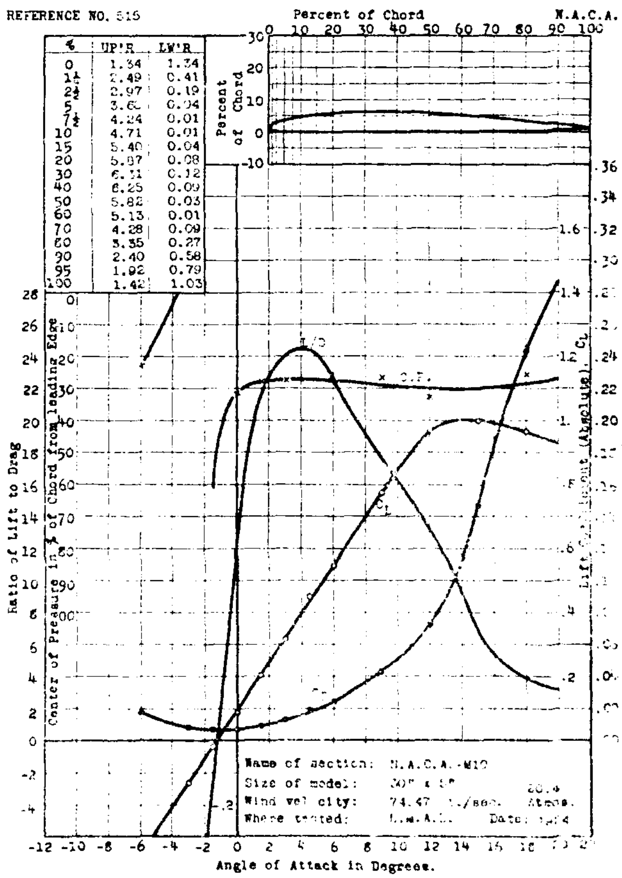


%	UP'R	LW'R
0	.00	.00
1¼	1.97	-1.76
2½	2.81	-2.20
5	4.03	-2.73
7½	4.94	-3.03
10	5.71	-3.24
15	6.82	-3.47
20	7.55	-3.62
30	8.22	-3.79
40	8.05	-3.90
50	7.26	-3.94
60	6.03	-3.82
70	4.58	-3.48
80	3.06	-2.83
90	1.55	-1.77
95	.88	-1.08
100	.26	- .26


REFERENCE NO. 512
Percent of Chord
N.A.C.A.
Ratio of Lift to Drag
Center of Pressure in % of Chord from leading Edge
Lift Coefficient (Absolute), C_L
Drag Coefficient (Absolute), C_D
C.P.
L/D
C_L
C_D
Name of section: N.A.C.A.-M7
Size of model: 30" x 5"
Wind velocity: 75.13 ft./sec. 20 Atmos.
Where tested: L.M.A.L. Date: 1924
Angle of Attack in Degrees.

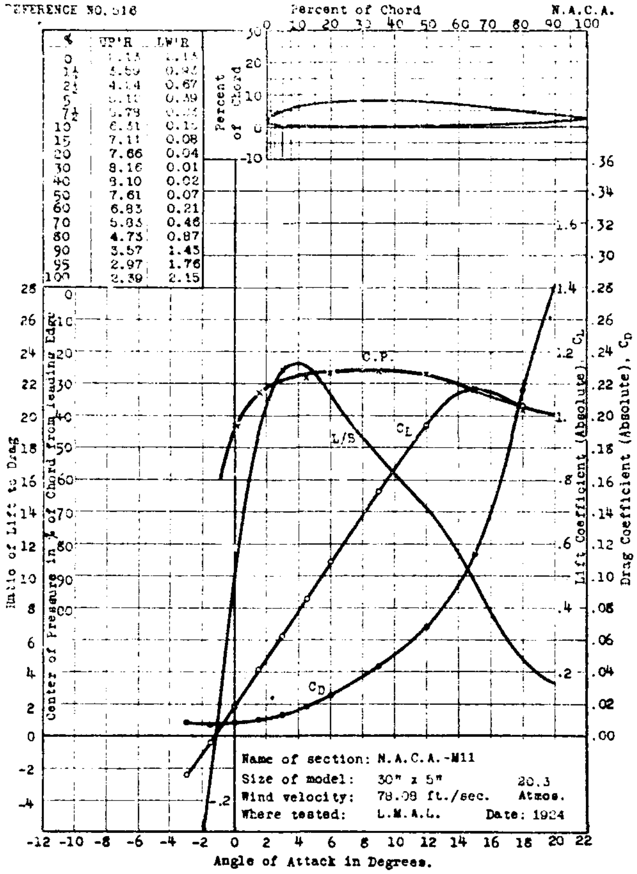

REFERENCE NO. 513
Percent of Chord
N.A.C.A.
Ratio of Lift to Drag
Center of Pressure in % of Chord from leading Edge
Lift Coefficient (Absolute), C_L
Drag Coefficient (Absolute), C_D
C.P.
L/D
C_L
C_D
Name of section: N.A.C.A.-M8
Size of model: 30" x 5"
Wind velocity: 75.49 ft./sec. 20 Atmos.
Where tested: L.M.A.L. Date: 1924
Angle of Attack in Degrees.


REFERENCE NO. 514
Percent of Chord
N.A.C.A.
Ratio of Lift to Drag
Center of Pressure in % of Chord from leading Edge
Lift Coefficient (Absolute), C_L
Drag Coefficient (Absolute), C_D
C.P.
L/D
C_L
C_D
Name of section N.A.C.A.-M9
Size of model. 30" x 5"
Wind velocity: 74.91 ft./sec. 20.1 Atmos
Where tested: L.M.A.L. Date 1924
Angle of Attack in Degrees.


REFERENCE NO. 515
Percent of Chord
N.A.C.A.
Ratio of Lift to Drag
Center of Pressure in % of Chord from leading Edge
L/D
C.P.
C_L
C_D
Name of section: N.A.C.A.-M10
Size of model: 30" x 5"
Wind velocity: 74.47 ft./sec. 20.4 Atmos.
Where tested: L.M.A.L. Date: 1924
Angle of Attack in Degrees.

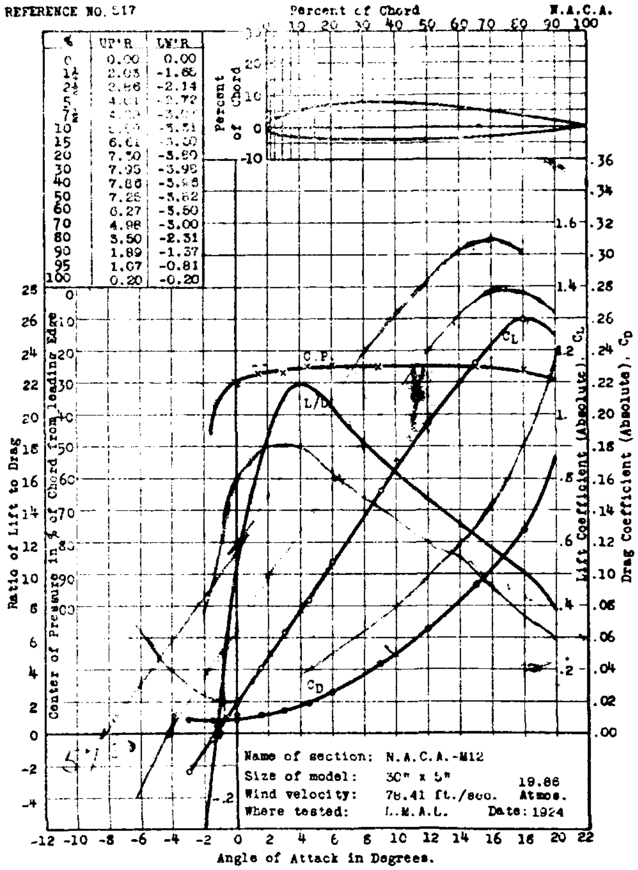
REFERENCE NO. 516

%	UP'R	LW'R
0	1.15	1.15
1¼	3.59	0.92
2½	4.14	0.67
5	5.12	0.39
7½	5.79	0.24
10	6.31	0.15
15	7.11	0.08
20	7.66	0.04
30	8.16	0.01
40	8.10	0.02
50	7.61	0.07
60	6.83	0.21
70	5.83	0.46
80	4.73	0.87
90	3.57	1.45
95	2.97	1.76
100	2.39	2.15



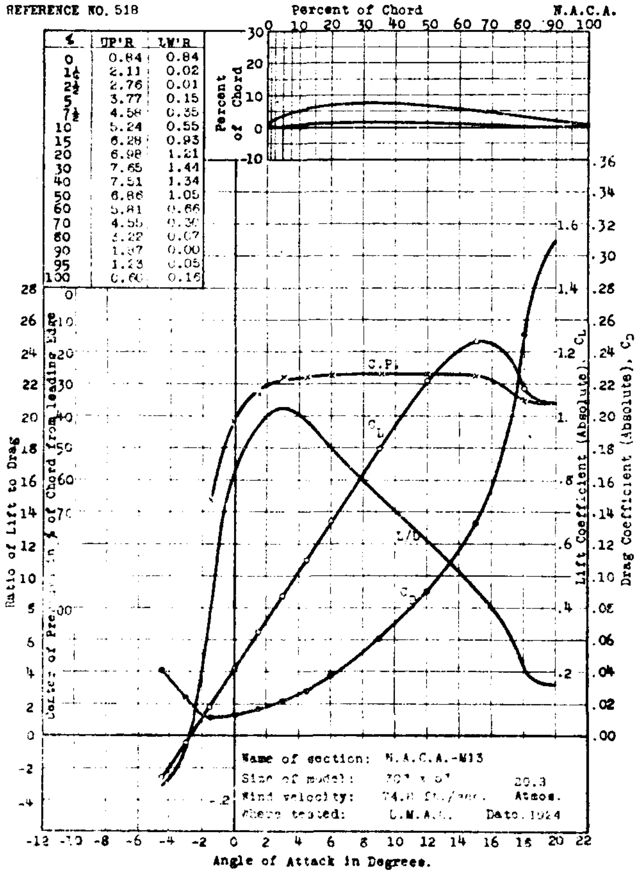
REFERENCE NO. 517

%	UP'R	LW'R
0	0.00	0.00
1¼	2.03	-1.68
2½	2.86	-2.14
5	4.01	-2.72
7½	4.83	-3.07
10	5.55	-3.31
15	6.61	-3.60
20	7.30	-3.80
30	7.95	-3.98
40	7.86	-3.93
50	7.25	-3.62
60	6.27	-3.50
70	4.98	-3.00
80	3.50	-2.31
90	1.89	-1.37
95	1.07	-0.81
100	0.20	-0.20



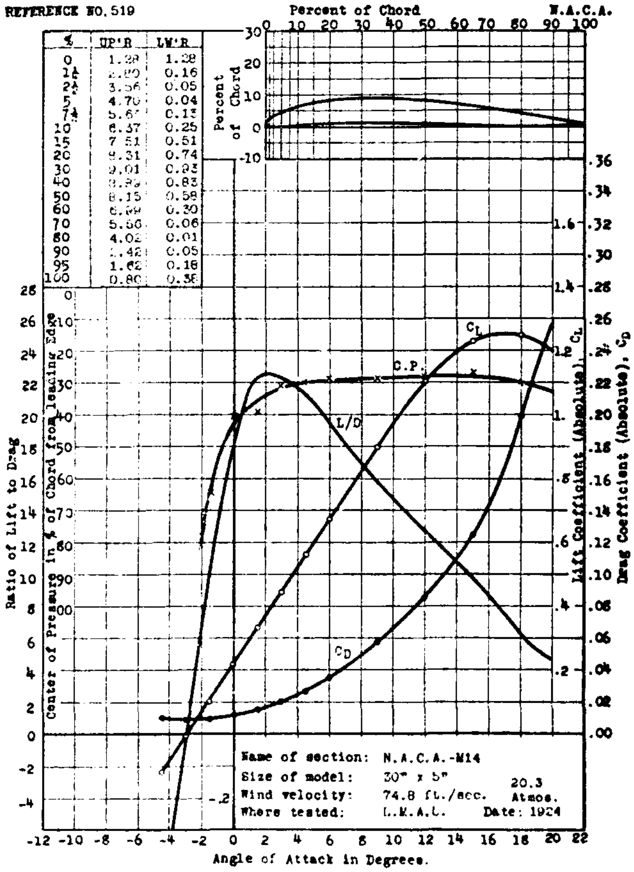
REFERENCE NO. 518

%	UP'R	LW'R
0	0.84	0.84
1¼	2.11	0.02
2½	2.76	0.01
5	3.77	0.15
7½	4.58	0.35
10	5.24	0.55
15	6.28	0.93
20	6.98	1.21
30	7.65	1.44
40	7.51	1.34
50	6.86	1.05
60	5.81	0.66
70	4.55	0.30
80	3.22	0.07
90	1.87	0.00
95	1.23	0.05
100	0.60	0.16



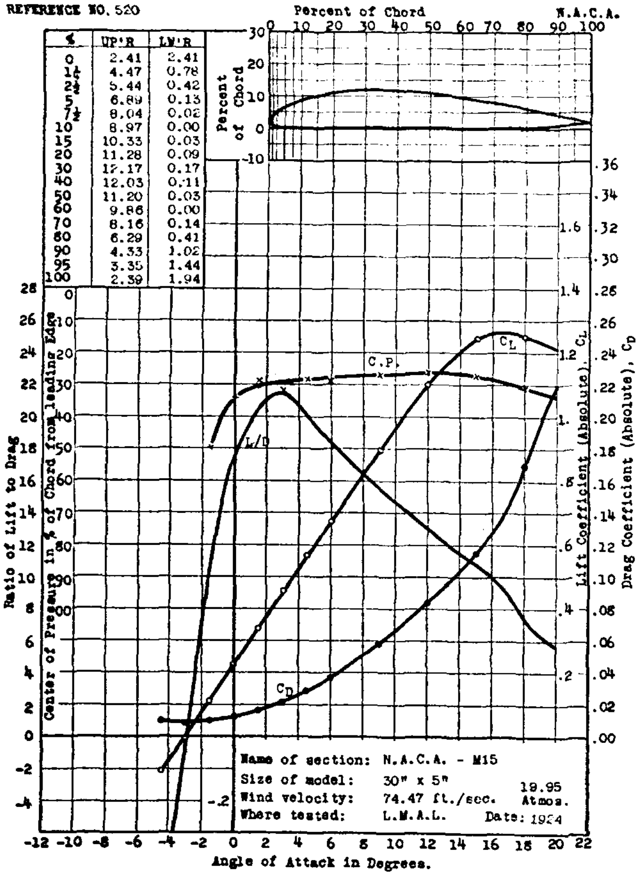
REFERENCE NO. 519

%	UP'R	LW'R
0	1.28	1.28
1¼	2.80	0.16
2½	3.56	0.05
5	4.70	0.04
7½	5.67	0.13
10	6.37	0.25
15	7.51	0.51
20	8.31	0.74
30	9.01	0.93
40	8.86	0.83
50	8.15	0.58
60	6.99	0.30
70	5.56	0.06
80	4.02	0.01
90	2.42	0.05
95	1.62	0.18
100	0.80	0.38



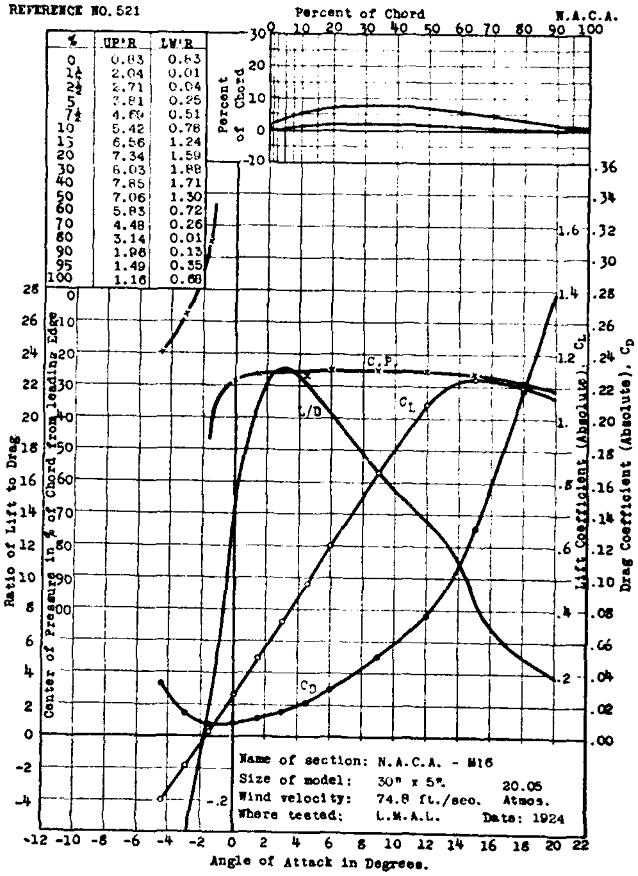
REFERENCE NO. 520

%	UP'R	LW'R
0	2.41	2.41
1¼	4.47	0.78
2½	5.44	0.42
5	6.89	0.13
7½	8.04	0.02
10	8.97	0.00
15	10.33	0.03
20	11.28	0.09
30	12.17	0.17
40	12.03	0.11
50	11.20	0.03
60	9.86	0.00
70	8.16	0.14
80	6.29	0.41
90	4.33	1.02
95	3.35	1.44
100	2.39	1.94



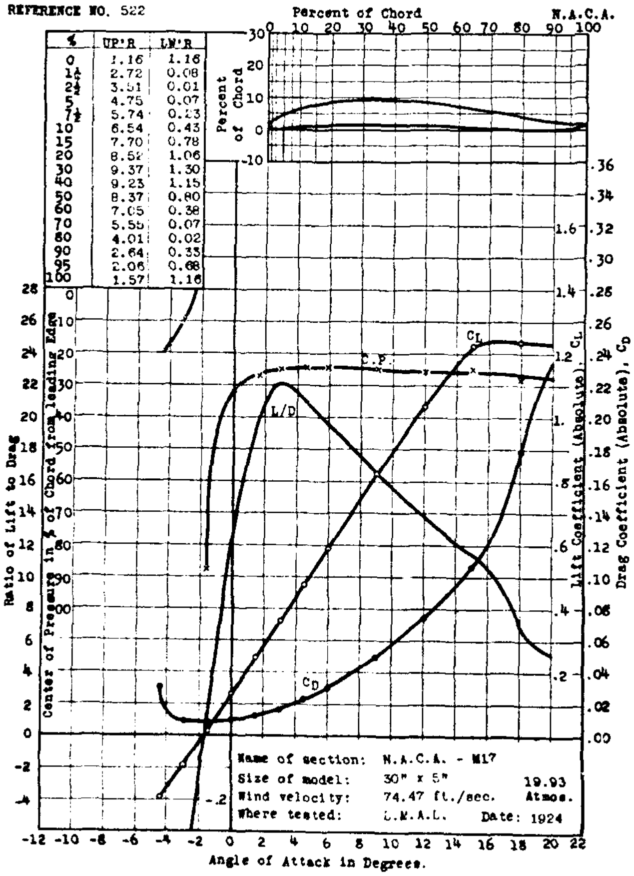
REFERENCE NO. 521

%	UP'R	LW'R
0	0.83	0.83
1¼	2.04	0.01
2½	2.71	0.04
5	3.81	0.25
7½	4.69	0.51
10	5.42	0.78
15	6.56	1.24
20	7.34	1.59
30	8.03	1.88
40	7.85	1.71
50	7.06	1.30
60	5.83	0.72
70	4.48	0.26
80	3.14	0.01
90	1.86	0.13
95	1.49	0.35
100	1.16	0.68



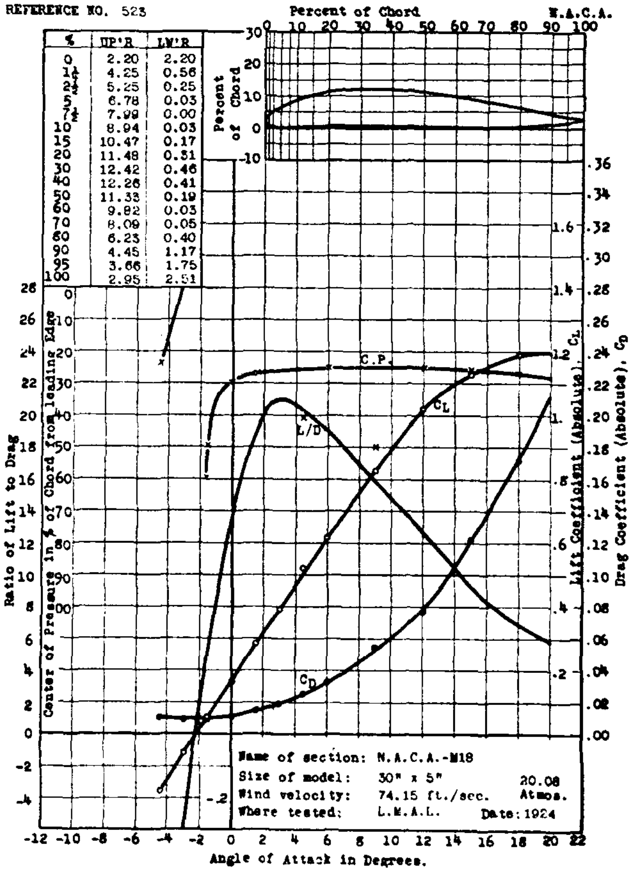
REFERENCE NO. 522

%	UP'R	LW'R
0	1.16	1.16
1¼	2.72	0.08
2½	3.51	0.01
5	4.75	0.07
7½	5.74	0.23
10	6.54	0.43
15	7.70	0.78
20	8.52	1.06
30	9.37	1.30
40	9.23	1.15
50	8.37	0.80
60	7.05	0.38
70	5.55	0.07
80	4.01	0.02
90	2.64	0.33
95	2.06	0.68
100	1.57	1.16



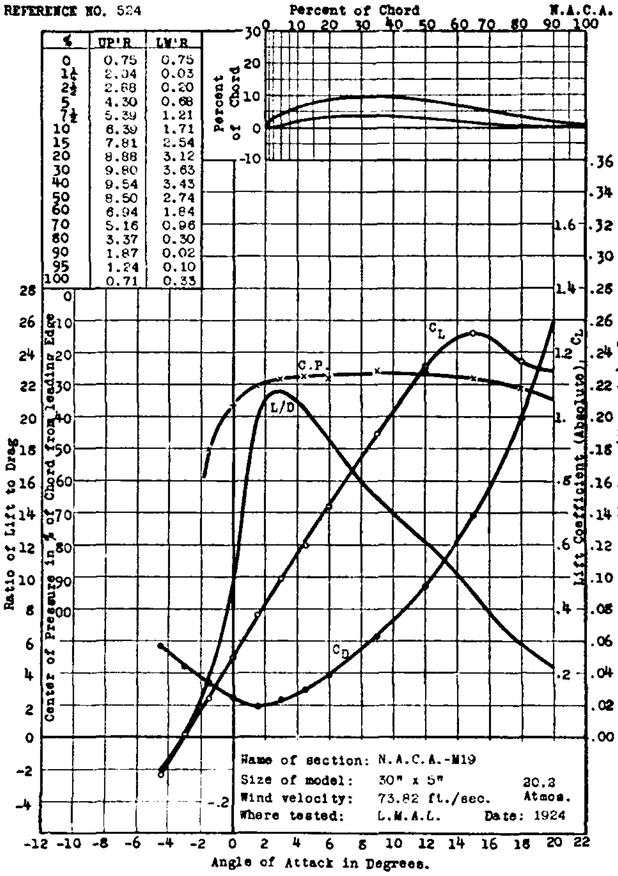
REFERENCE NO. 523

%	UP'R	LW'R
0	2.20	2.20
1¼	4.25	0.56
2½	5.25	0.25
5	6.78	0.03
7½	7.99	0.00
10	8.94	0.03
15	10.47	0.17
20	11.48	0.31
30	12.42	0.46
40	12.26	0.41
50	11.33	0.19
60	9.82	0.03
70	8.09	0.05
80	6.23	0.40
90	4.45	1.17
95	3.66	1.75
100	2.95	2.51



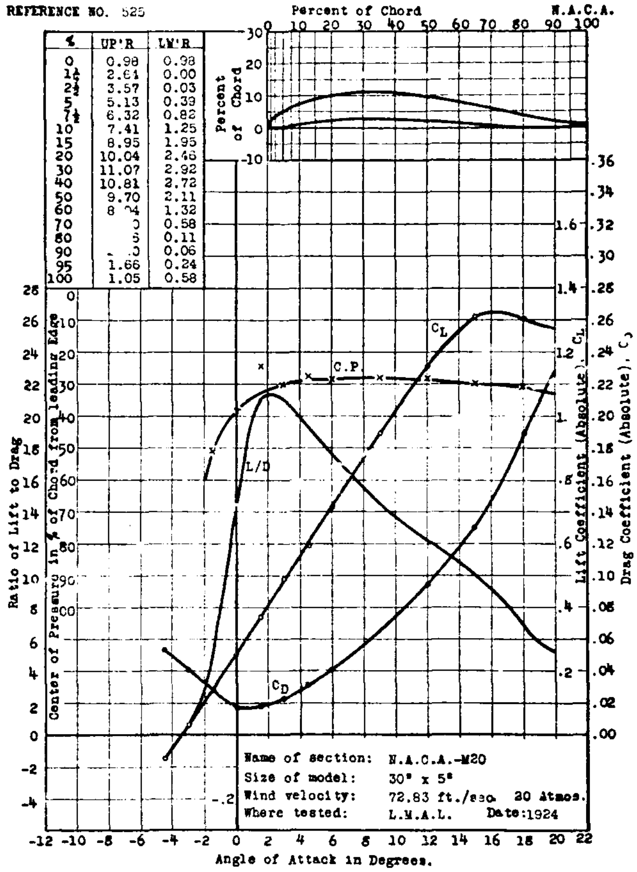
REFERENCE NO. 524 N.A.C.A.

%	UP'R	LW'R
0	0.75	0.75
1¼	2.04	0.03
2½	2.88	0.20
5	4.30	0.68
7½	5.39	1.21
10	6.39	1.71
15	7.81	2.54
20	8.88	3.12
30	9.80	3.63
40	9.54	3.43
50	8.50	2.74
60	6.94	1.84
70	5.16	0.96
80	3.37	0.30
90	1.87	0.02
95	1.24	0.10
100	0.71	0.33



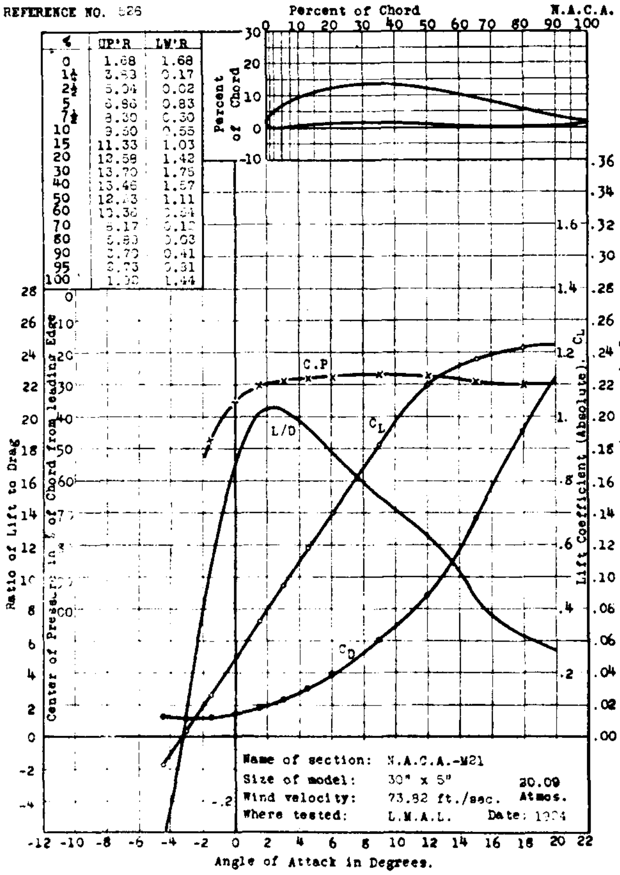
REFERENCE NO. 525 N.A.C.A.

%	UP'R	LW'R
0	0.98	0.98
1¼	2.61	0.00
2½	3.57	0.03
5	5.13	0.39
7½	6.32	0.82
10	7.41	1.25
15	8.95	1.95
20	10.04	2.46
30	11.07	2.92
40	10.81	2.72
50	9.70	2.11
60	[illegible]	1.32
70	[illegible]	0.58
80	[illegible]	0.11
90	[illegible]	0.06
95	1.66	0.24
100	1.05	0.58



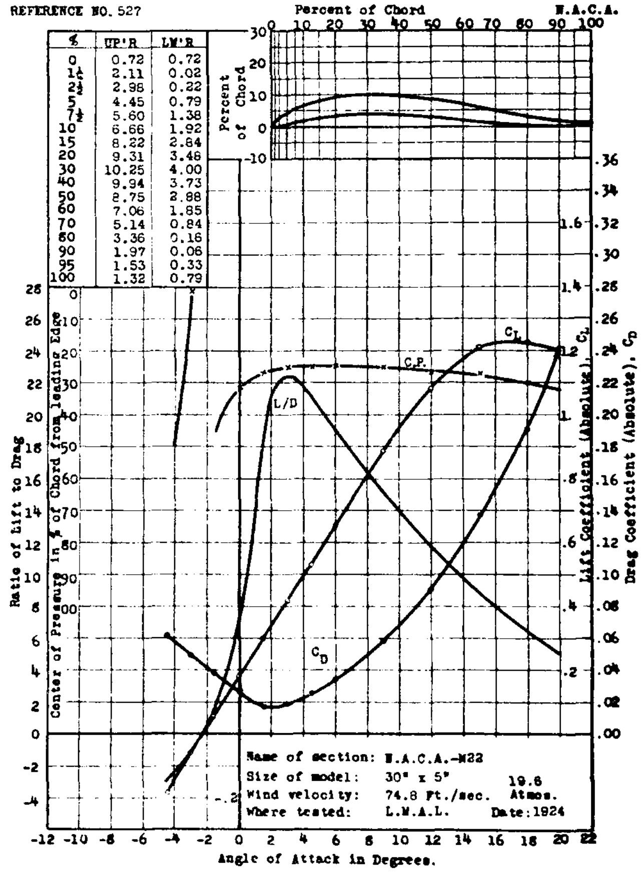
REFERENCE NO. 526 N.A.C.A.

%	UP'R	LW'R
0	1.68	1.68
1¼	[illegible]	0.17
2½	5.04	0.02
5	6.96	0.83
7½	8.30	0.30
10	9.50	0.55
15	11.33	1.03
20	12.59	1.42
30	13.70	1.75
40	13.46	1.57
50	[illegible]	1.11
60	[illegible]	[illegible]
70	[illegible]	[illegible]
80	[illegible]	0.03
90	[illegible]	0.41
95	[illegible]	0.31
100	[illegible]	1.44



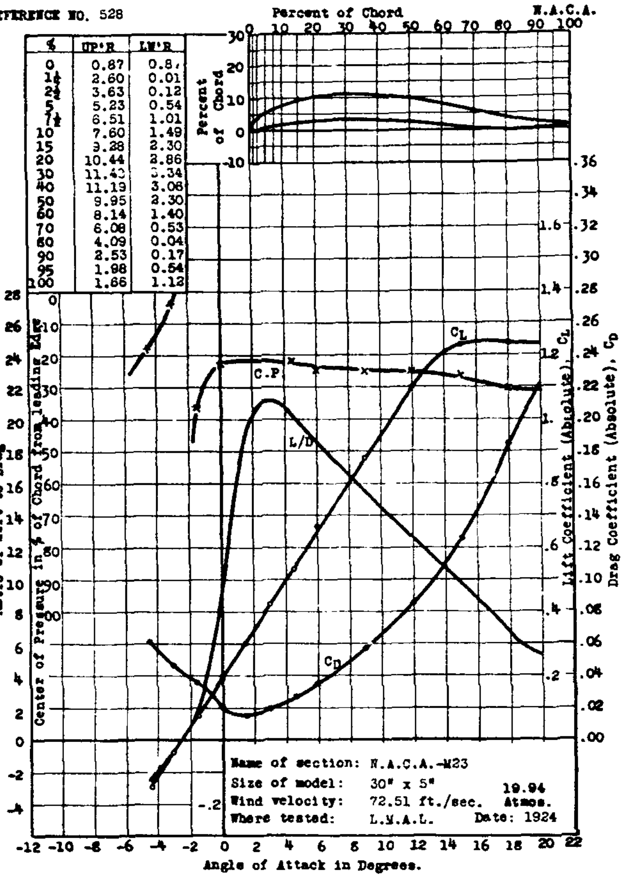
REFERENCE NO. 527 N.A.C.A.

%	UP'R	LW'R
0	0.72	0.72
1¼	2.11	0.02
2½	2.98	0.22
5	4.45	0.79
7½	5.60	1.38
10	6.66	1.92
15	8.22	2.64
20	9.31	3.46
30	10.25	4.00
40	9.94	3.73
50	8.75	2.88
60	7.06	1.85
70	5.14	0.84
80	3.36	0.16
90	1.97	0.06
95	1.53	0.33
100	1.32	0.79



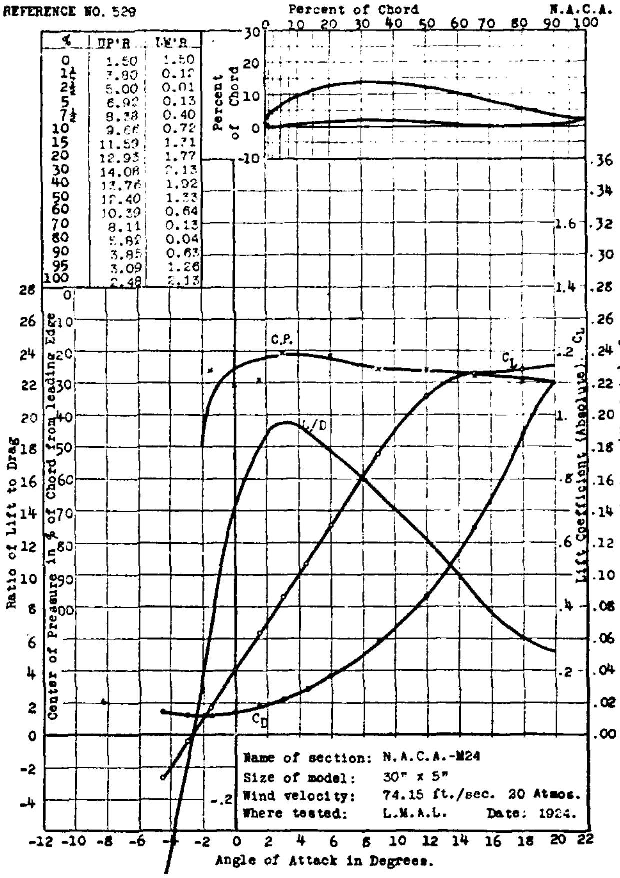
REFERENCE NO. 528

%	UP'R	LW'R
0	0.87	0.8[illegible]
1¼	2.60	0.01
2½	3.63	0.12
5	5.23	0.54
7½	6.51	1.01
10	7.60	1.49
15	9.28	2.30
20	10.44	2.86
30	11.43	3.34
40	11.19	3.08
50	9.95	2.30
60	8.14	1.40
70	6.08	0.53
80	4.09	0.04
90	2.53	0.17
95	1.88	0.54
100	1.66	1.12



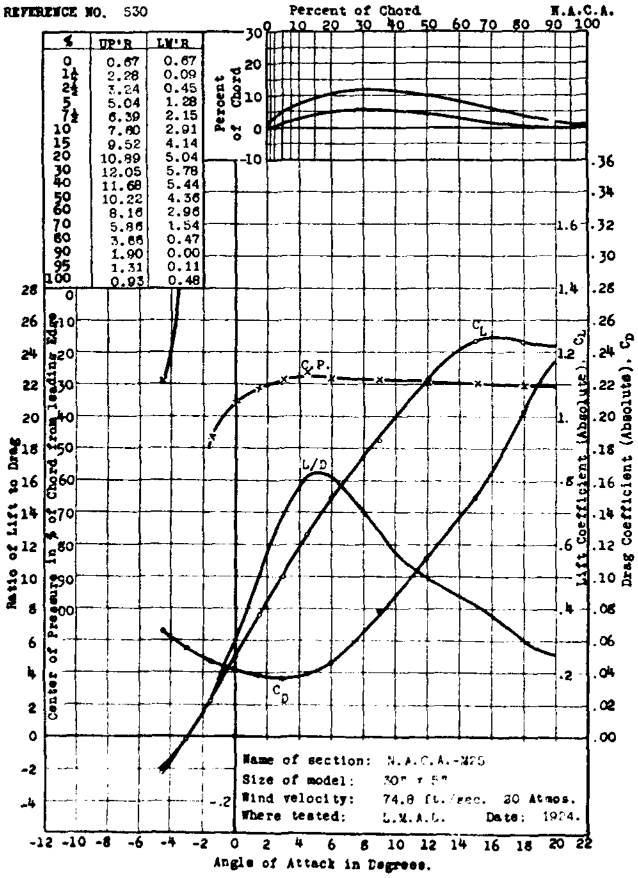
REFERENCE NO. 529

%	UP'R	LW'R
0	1.50	1.50
1¼	3.80	0.12
2½	5.00	0.01
5	6.92	0.13
7½	8.38	0.40
10	9.66	0.72
15	11.59	1.71
20	12.93	1.77
30	14.08	2.13
40	13.76	1.92
50	12.40	1.33
60	10.39	0.64
70	8.11	0.13
80	5.82	0.04
90	3.85	0.63
95	3.09	1.26
100	2.48	2.13



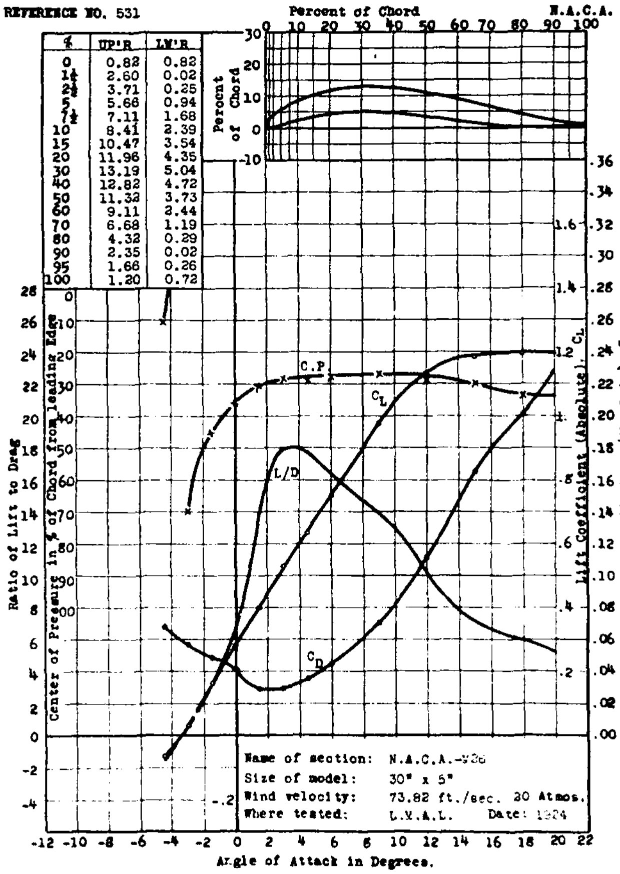
REFERENCE NO. 530

%	UP'R	LW'R
0	0.67	0.67
1¼	2.28	0.09
2½	3.24	0.45
5	5.04	1.28
7½	6.39	2.15
10	7.80	2.91
15	9.52	4.14
20	10.89	5.04
30	12.05	5.78
40	11.68	5.44
50	10.22	4.36
60	8.16	2.96
70	5.86	1.54
80	3.66	0.47
90	1.90	0.00
95	1.31	0.11
100	0.93	0.48



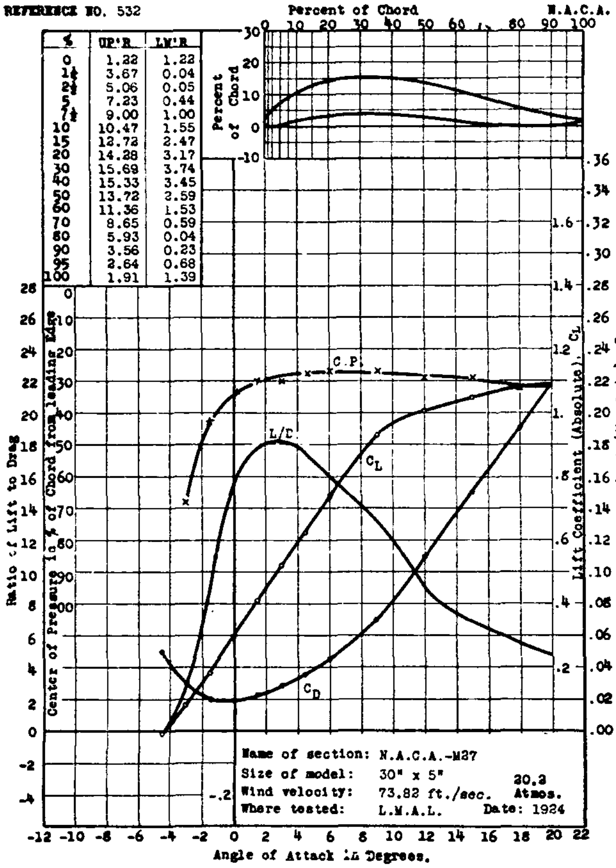
REFERENCE NO. 531

%	UP'R	LW'R
0	0.82	0.82
1¼	2.60	0.02
2½	3.71	0.25
5	5.66	0.94
7½	7.11	1.68
10	8.41	2.39
15	10.47	3.54
20	11.96	4.35
30	13.19	5.04
40	12.82	4.72
50	11.32	3.73
60	9.11	2.44
70	6.68	1.19
80	4.32	0.29
90	2.35	0.02
95	1.66	0.26
100	1.20	0.72



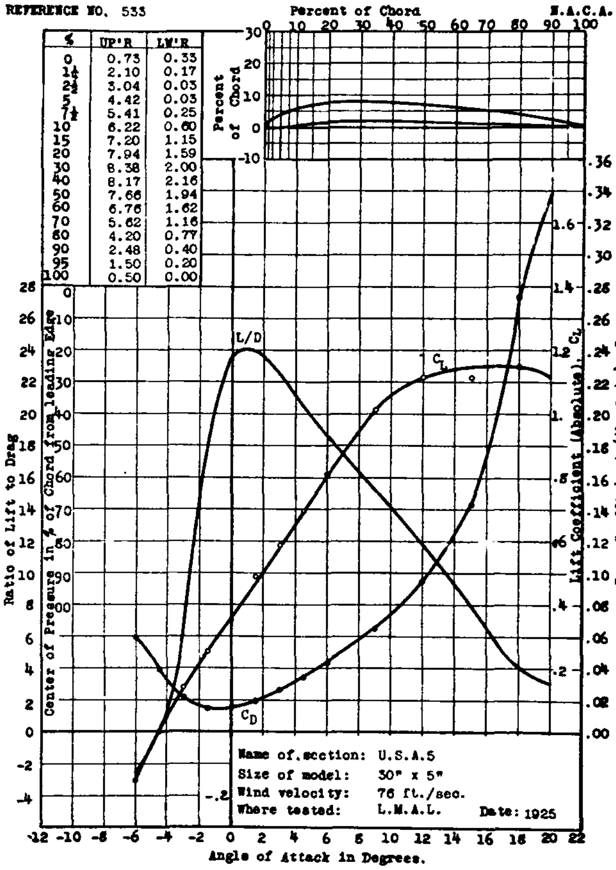
REFERENCE NO. 532

%	UP'R	LW'R
0	1.22	1.22
1¼	3.67	0.04
2½	5.06	0.05
5	7.23	0.44
7½	9.00	1.00
10	10.47	1.55
15	12.72	2.47
20	14.28	3.17
30	15.69	3.74
40	15.33	3.45
50	13.72	2.59
60	11.36	1.53
70	8.65	0.59
80	5.93	0.04
90	3.56	0.23
95	2.64	0.68
100	1.91	1.39



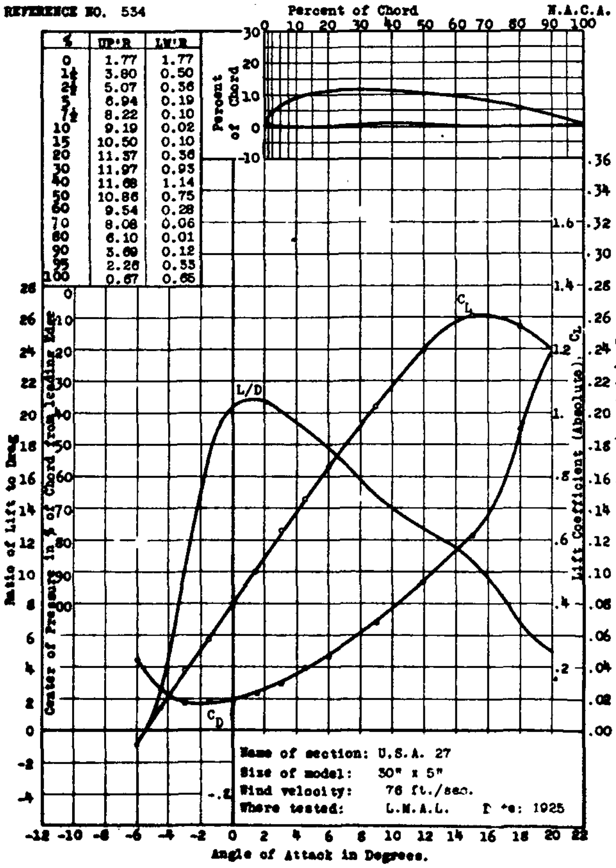
REFERENCE NO. 533

%	UP'R	LW'R
0	0.73	0.33
1¼	2.10	0.17
2½	3.04	0.03
5	4.42	0.03
7½	5.41	0.25
10	6.22	0.60
15	7.20	1.15
20	7.94	1.59
30	8.38	2.00
40	8.17	2.16
50	7.66	1.94
60	6.76	1.62
70	5.62	1.16
80	4.20	0.77
90	2.48	0.40
95	1.50	0.20
100	0.50	0.00



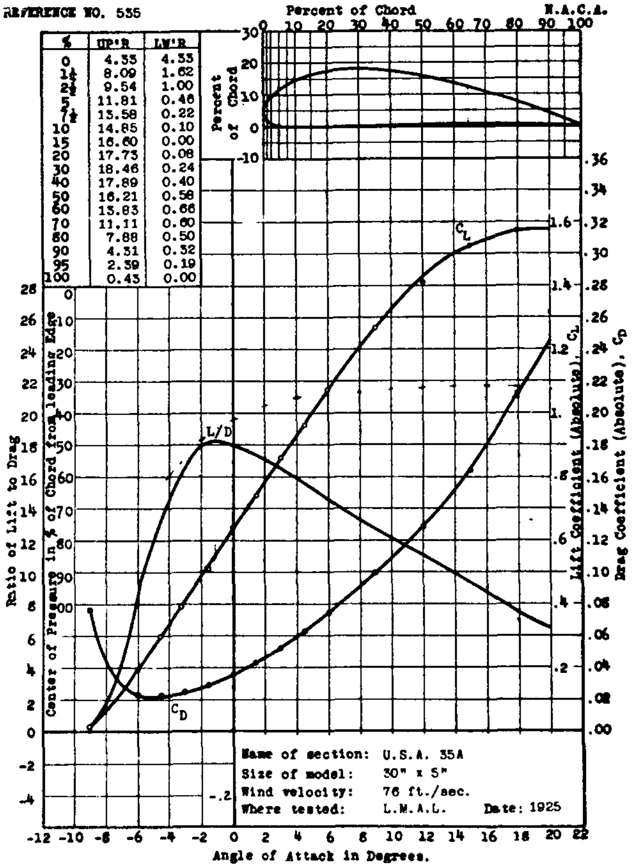
REFERENCE NO. 534

%	UP'R	LW'R
0	1.77	1.77
1¼	3.80	0.50
2½	5.07	0.36
5	6.94	0.19
7½	8.22	0.10
10	9.19	0.02
15	10.50	0.10
20	11.37	0.36
30	11.97	0.93
40	11.68	1.14
50	10.86	0.75
60	9.54	0.28
70	8.08	0.06
80	6.10	0.01
90	3.69	0.12
95	2.26	0.33
100	0.67	0.65

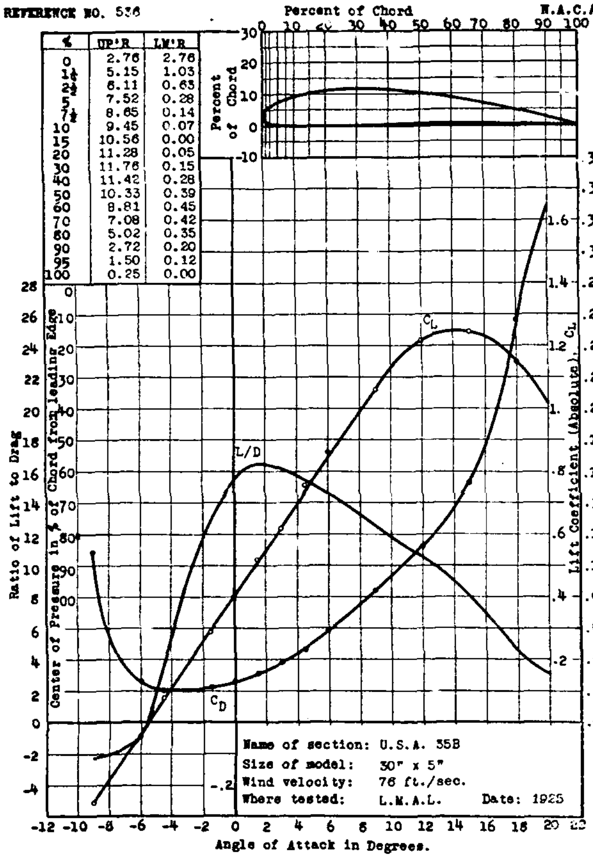


REFERENCE NO. 535

%	UP'R	LW'R
0	4.33	4.33
1¼	8.09	1.62
2½	9.54	1.00
5	11.81	0.46
7½	13.58	0.22
10	14.85	0.10
15	16.60	0.00
20	17.73	0.08
30	18.46	0.24
40	17.89	0.40
50	16.21	0.58
60	13.83	0.66
70	11.11	0.60
80	7.88	0.50
90	4.31	0.32
95	2.39	0.19
100	0.43	0.00

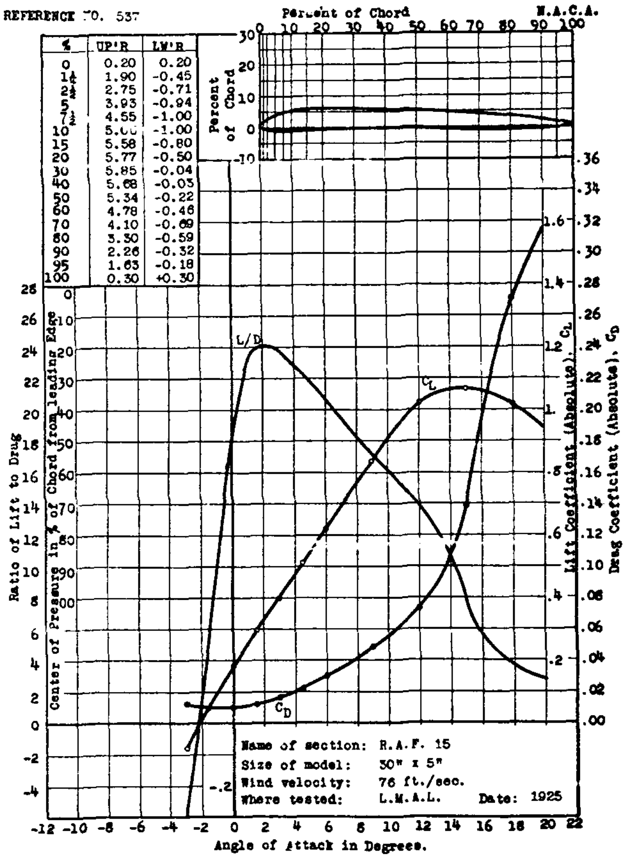


REFERENCE NO. 536



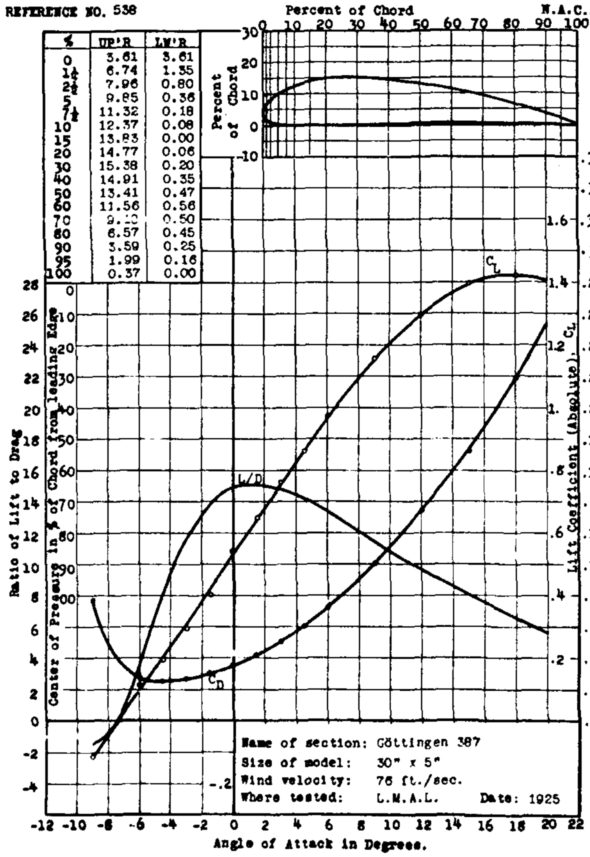
%	UP'R	LW'R
0	2.76	2.76
1¼	5.15	1.03
2½	6.11	0.63
5	7.52	0.28
7½	8.65	0.14
10	9.45	0.07
15	10.56	0.00
20	11.28	0.05
30	11.78	0.15
40	11.42	0.28
50	10.33	0.39
60	8.81	0.45
70	7.08	0.42
80	5.02	0.35
90	2.72	0.20
95	1.50	0.12
100	0.25	0.00

REFERENCE NO. 537



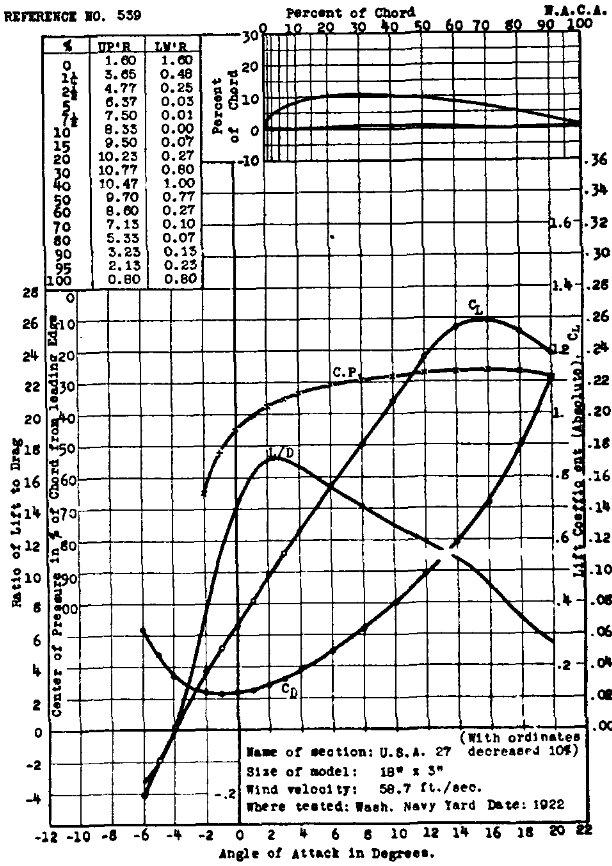
%	UP'R	LW'R
0	0.20	0.20
1¼	1.90	-0.45
2½	2.75	-0.71
5	3.93	-0.94
7½	4.55	-1.00
10	5.00	-1.00
15	5.58	-0.80
20	5.77	-0.50
30	5.85	-0.04
40	5.68	-0.03
50	5.34	-0.22
60	4.78	-0.46
70	4.10	-0.69
80	3.30	-0.59
90	2.26	-0.32
95	1.63	-0.18
100	0.30	+0.30

REFERENCE NO. 538



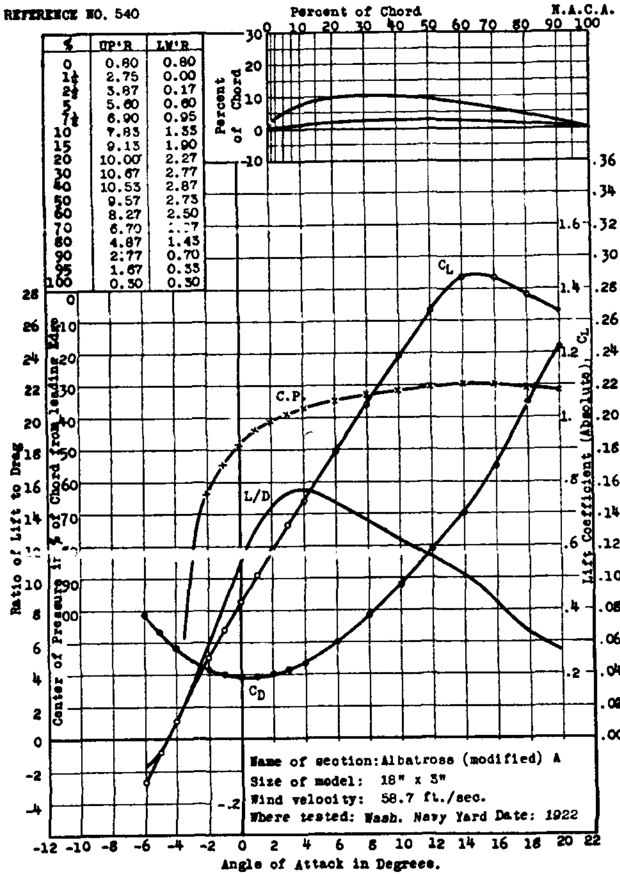
%	UP'R	LW'R
0	3.61	3.61
1¼	6.74	1.35
2½	7.96	0.80
5	9.85	0.36
7½	11.32	0.18
10	12.37	0.08
15	13.83	0.00
20	14.77	0.06
30	15.38	0.20
40	14.91	0.35
50	13.41	0.47
60	11.56	0.56
70	9.10	0.50
80	6.57	0.45
90	3.59	0.25
95	1.99	0.16
100	0.37	0.00

REFERENCE NO. 539



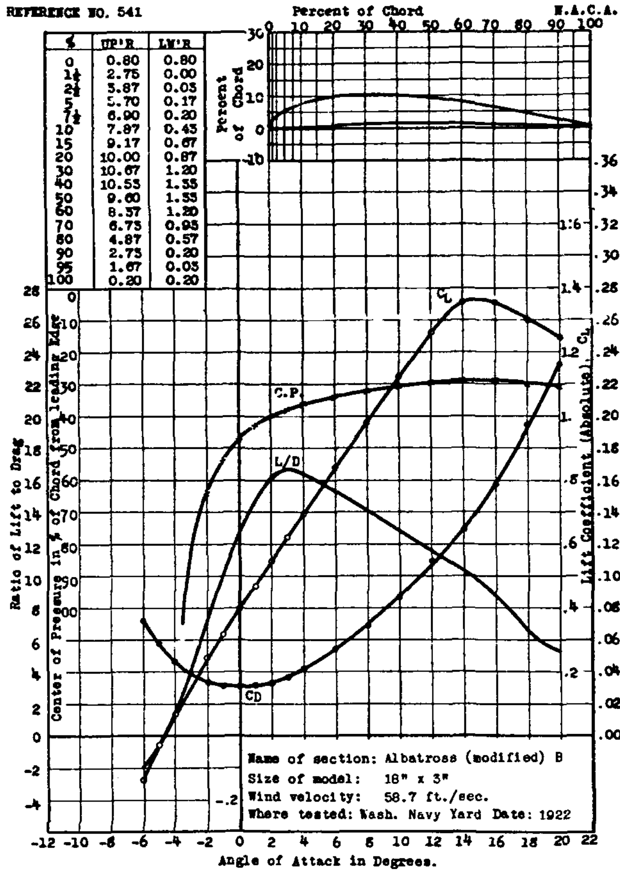
%	UP'R	LW'R
0	1.60	1.60
1¼	3.65	0.48
2½	4.77	0.25
5	6.37	0.03
7½	7.50	0.01
10	8.33	0.00
15	9.50	0.07
20	10.23	0.27
30	10.77	0.80
40	10.47	1.00
50	9.70	0.77
60	8.60	0.27
70	7.13	0.10
80	5.33	0.07
90	3.23	0.13
95	2.13	0.23
100	0.80	0.80

REFERENCE NO. 540



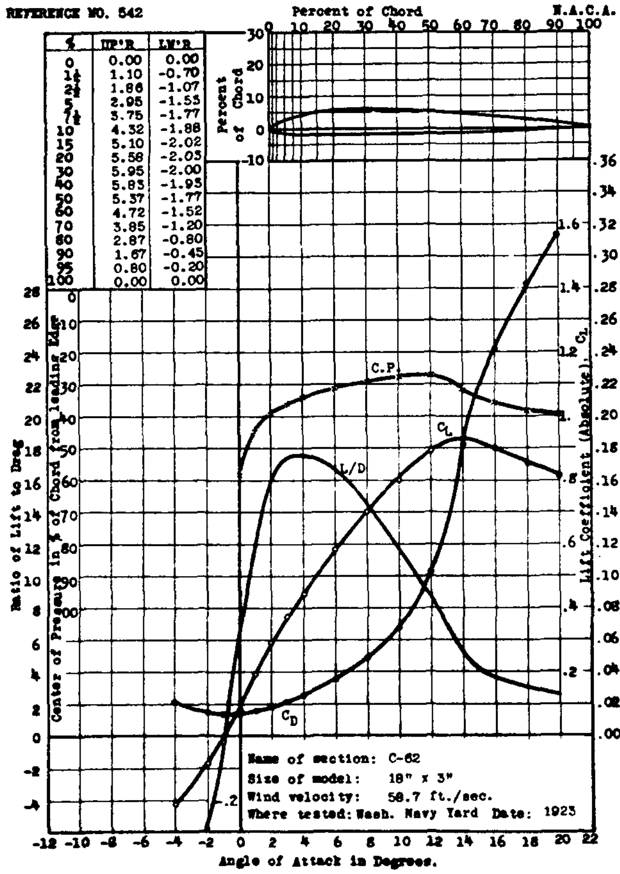
%	UP'R	LW'R
0	0.80	0.80
1¼	2.75	0.00
2½	3.87	0.17
5	5.60	0.60
7½	6.90	0.95
10	7.83	1.33
15	9.13	1.90
20	10.00	2.27
30	10.67	2.77
40	10.53	2.87
50	9.57	2.73
60	8.27	2.50
70	6.70	[illegible]
80	4.87	1.43
90	2.77	0.70
95	1.67	0.33
100	0.30	0.30

REFERENCE NO. 541



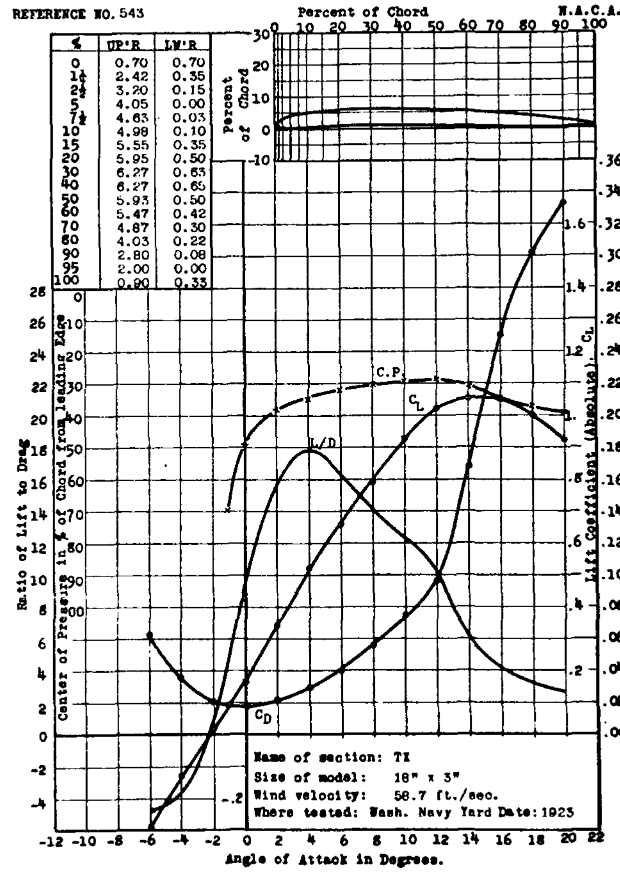
%	UP'R	LW'R
0	0.80	0.80
1¼	2.75	0.00
2½	3.87	0.03
5	5.70	0.17
7½	6.90	0.20
10	7.87	0.43
15	9.17	0.67
20	10.00	0.87
30	10.67	1.20
40	10.53	1.33
50	9.60	1.33
60	8.57	1.20
70	6.73	0.93
80	4.87	0.57
90	2.73	0.20
95	1.67	0.03
100	0.20	0.20

REFERENCE NO. 542



%	UP'R	LW'R
0	0.00	0.00
1¼	1.10	-0.70
2½	1.86	-1.07
5	2.95	-1.53
7½	3.75	-1.77
10	4.32	-1.88
15	5.10	-2.02
20	5.58	-2.03
30	5.95	-2.00
40	5.83	-1.95
50	5.37	-1.77
60	4.72	-1.52
70	3.85	-1.20
80	2.87	-0.80
90	1.67	-0.45
95	0.80	-0.20
100	0.00	0.00

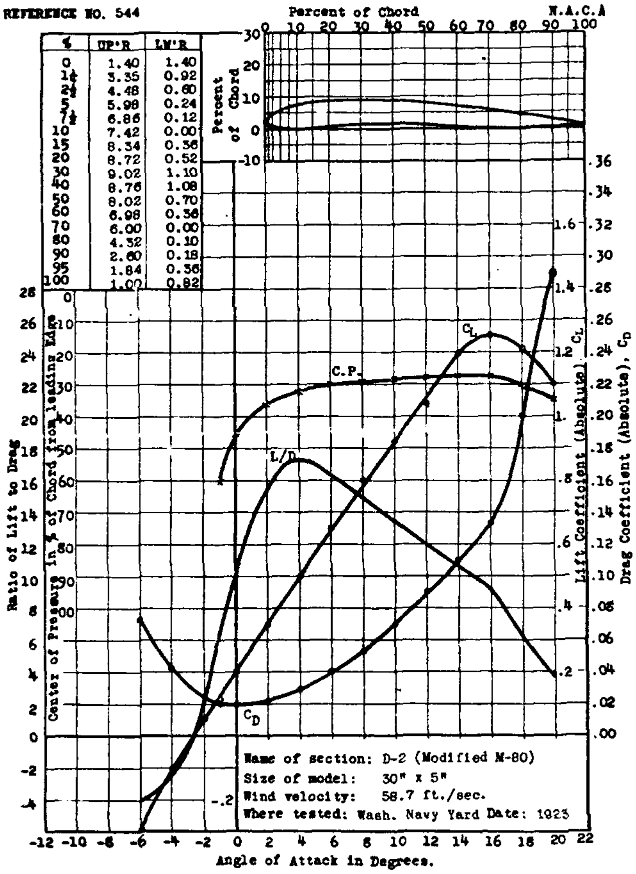
REFERENCE NO. 543



%	UP'R	LW'R
0	0.70	0.70
1¼	2.42	0.35
2½	3.20	0.15
5	4.05	0.00
7½	4.63	0.03
10	4.98	0.10
15	5.55	0.35
20	5.95	0.50
30	6.27	0.63
40	6.27	0.65
50	5.93	0.50
60	5.47	0.42
70	4.87	0.30
80	4.03	0.22
90	2.80	0.08
95	2.00	0.00
100	0.90	0.33

REFERENCE NO. 544

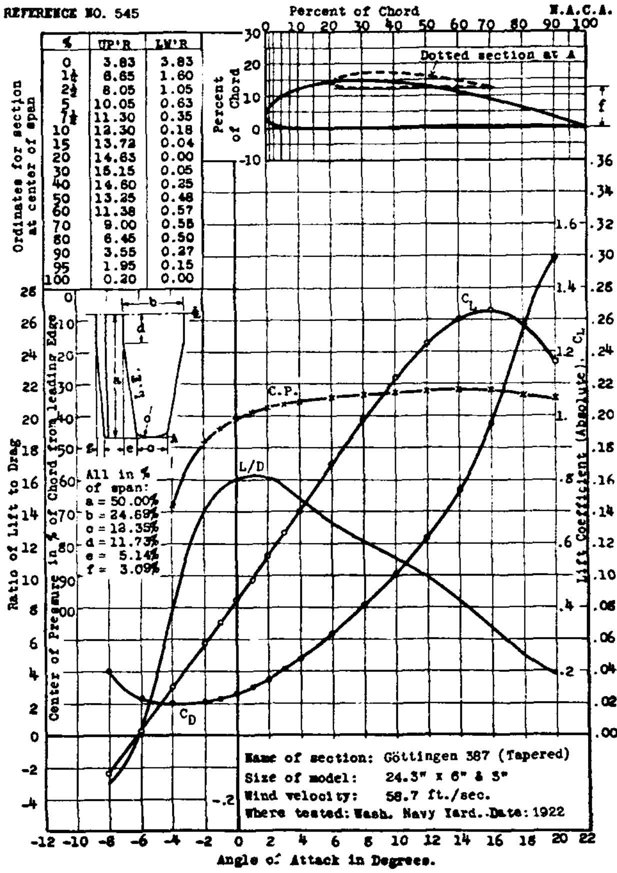
%	UP'R	LW'R
0	1.40	1.40
1¼	3.35	0.92
2½	4.48	0.60
5	5.98	0.24
7½	6.86	0.12
10	7.42	0.00
15	8.34	0.36
20	8.72	0.52
30	9.02	1.10
40	8.76	1.08
50	8.02	0.70
60	6.98	0.38
70	6.00	0.00
80	4.32	0.10
90	2.60	0.18
95	1.84	0.36
100	1.00	0.82



REFERENCE NO. 545

Ordinates for section at center of span

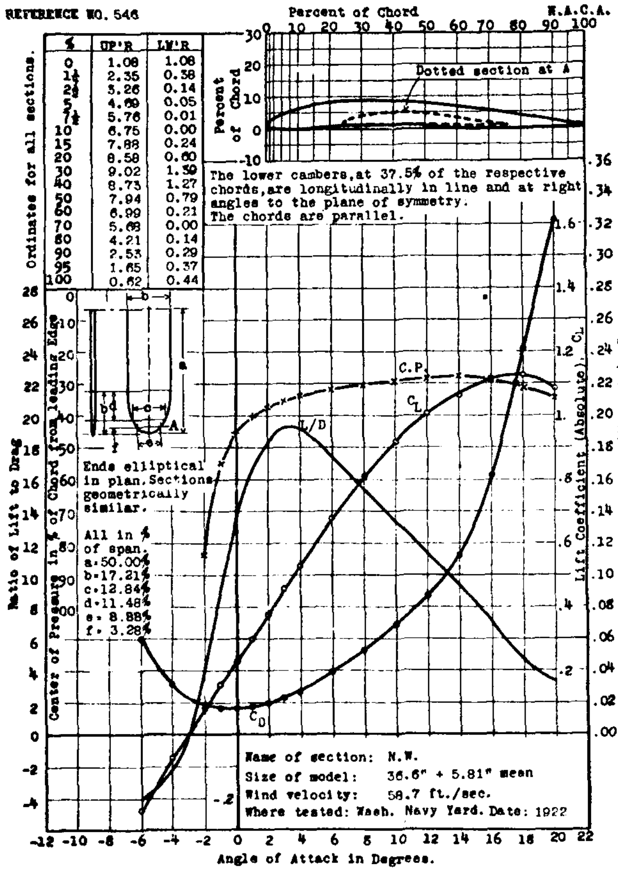
%	UP'R	LW'R
0	3.83	3.83
1¼	6.65	1.60
2½	8.05	1.05
5	10.05	0.63
7½	11.30	0.35
10	12.30	0.18
15	13.72	0.04
20	14.63	0.00
30	15.15	0.05
40	14.60	0.25
50	13.25	0.48
60	11.38	0.57
70	9.00	0.58
80	6.45	0.50
90	3.55	0.27
95	1.95	0.15
100	0.20	0.00



REFERENCE NO. 546

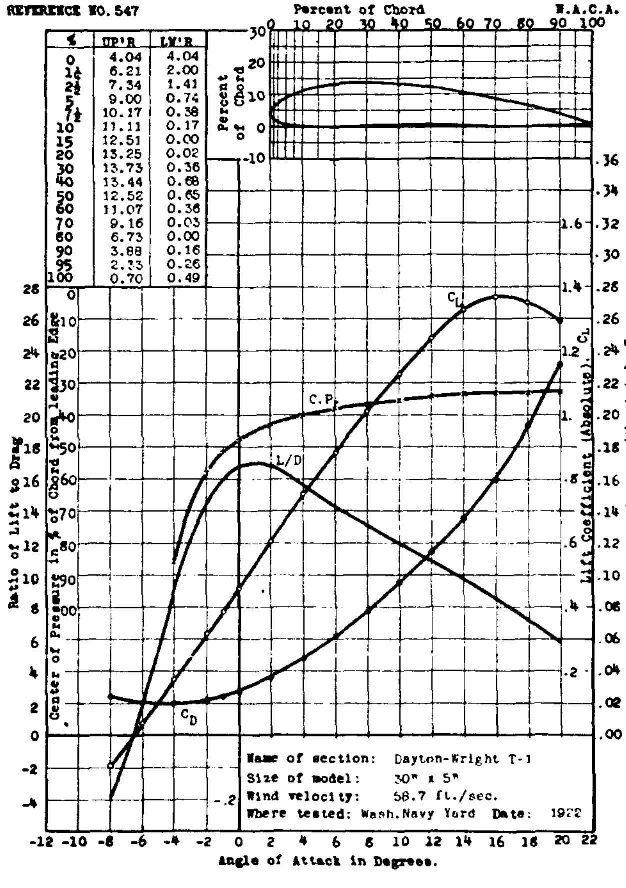
Ordinates for all sections.

%	UP'R	LW'R
0	1.08	1.08
1¼	2.35	0.38
2½	3.26	0.14
5	4.69	0.05
7½	5.76	0.01
10	6.75	0.00
15	7.88	0.24
20	8.58	0.60
30	9.02	1.39
40	8.73	1.27
50	7.94	0.79
60	6.99	0.21
70	5.68	0.00
80	4.21	0.14
90	2.53	0.29
95	1.65	0.37
100	0.62	0.44

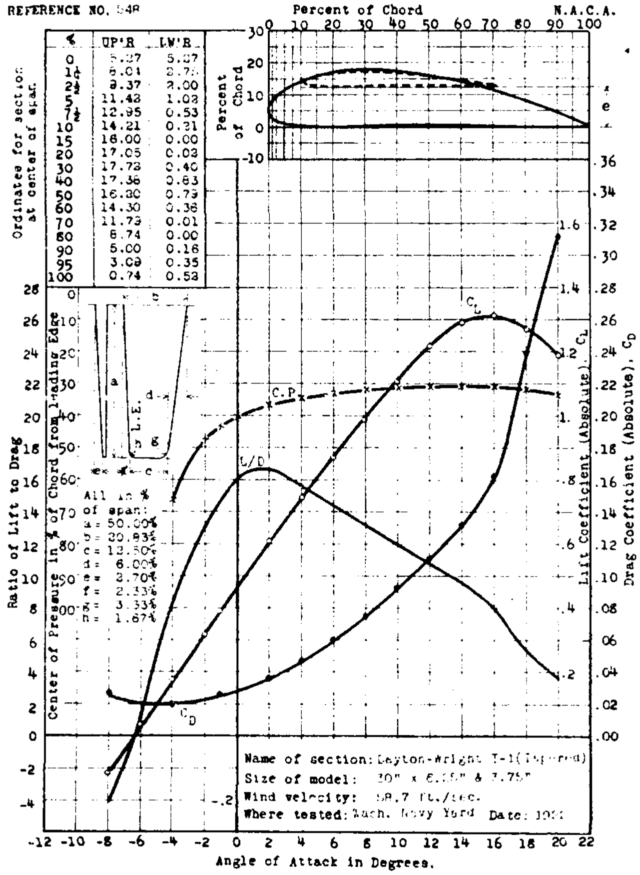


REFERENCE NO. 547

%	UP'R	LW'R
0	4.04	4.04
1¼	6.21	2.00
2½	7.34	1.41
5	9.00	0.74
7½	10.17	0.38
10	11.11	0.17
15	12.51	0.00
20	13.25	0.02
30	13.73	0.36
40	13.44	0.68
50	12.52	0.65
60	11.07	0.36
70	9.16	0.03
80	6.73	0.00
90	3.88	0.16
95	2.33	0.26
100	0.70	0.49



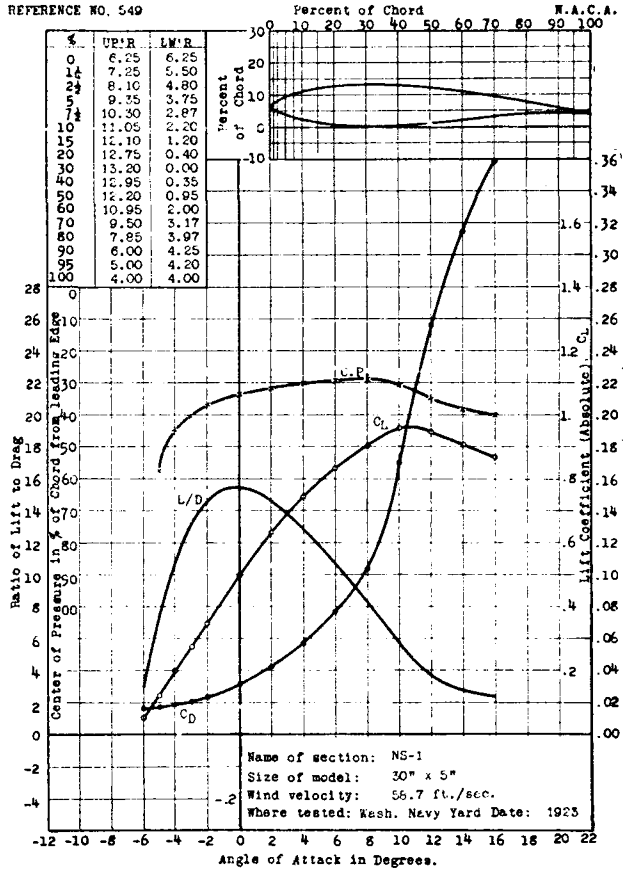
REFERENCE NO. 548



%	UP'R	LW'R
0	5.27	5.27
1¼	6.01	2.75
2½	9.37	2.00
5	11.43	1.03
7½	12.95	0.53
10	14.21	0.31
15	16.00	0.00
20	17.05	0.03
30	17.73	0.40
40	17.36	0.63
50	16.30	0.73
60	14.30	0.38
70	11.73	0.01
80	8.74	0.00
90	5.00	0.16
95	3.03	0.35
100	0.74	0.53

Name of section: Dayton-Wright T-1 (Tapered)
Size of model: 30" x 6.25" & 3.75"
Wind velocity: 58.7 ft./sec.
Where tested: Wash. Navy Yard Date: 192[illegible]

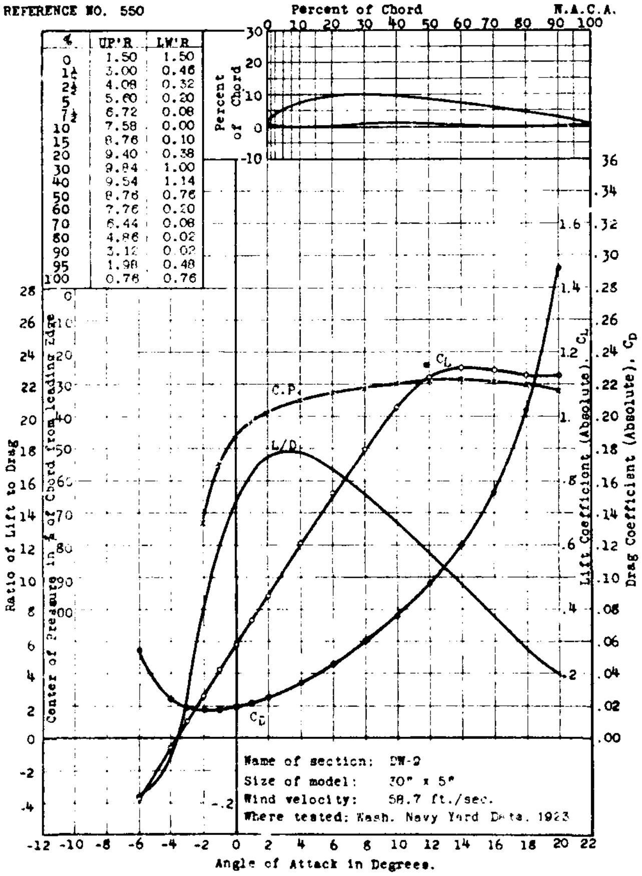
REFERENCE NO. 549



%	UP'R	LW'R
0	6.25	6.25
1¼	7.25	5.50
2½	8.10	4.80
5	9.35	3.75
7½	10.30	2.87
10	11.05	2.20
15	12.10	1.20
20	12.75	0.40
30	13.20	0.00
40	12.95	0.35
50	12.20	0.95
60	10.95	2.00
70	9.50	3.17
80	7.85	3.97
90	6.00	4.25
95	5.00	4.20
100	4.00	4.00

Name of section: NS-1
Size of model: 30" x 5"
Wind velocity: 58.7 ft./sec.
Where tested: Wash. Navy Yard Date: 1923

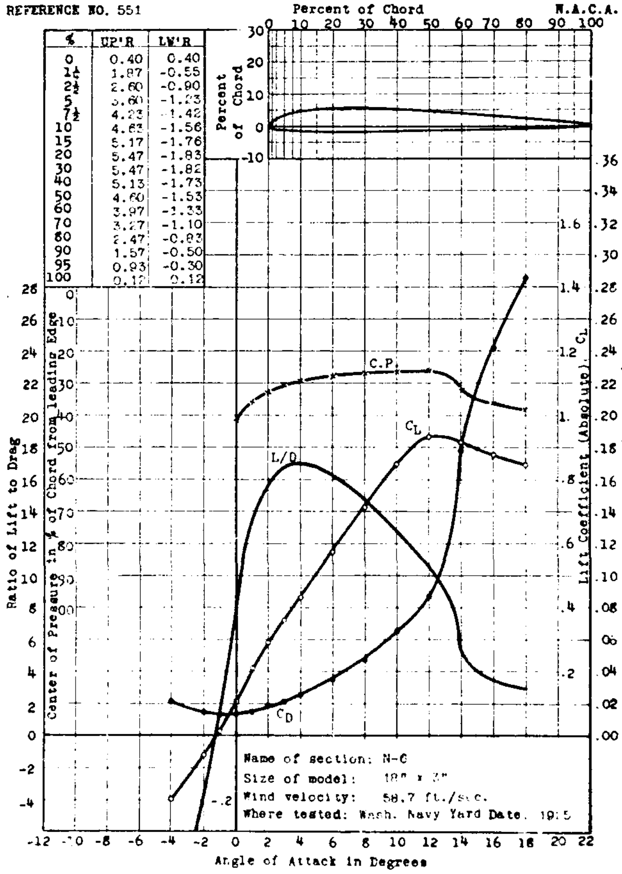
REFERENCE NO. 550



%	UP'R	LW'R
0	1.50	1.50
1¼	3.00	0.46
2½	4.08	0.32
5	5.60	0.20
7½	6.72	0.08
10	7.58	0.00
15	8.76	0.10
20	9.40	0.38
30	9.84	1.00
40	9.54	1.14
50	8.76	0.76
60	7.76	0.20
70	6.44	0.08
80	4.86	0.02
90	3.12	0.02
95	1.98	0.48
100	0.76	0.76

Name of section: DW-9
Size of model: 30" x 5"
Wind velocity: 58.7 ft./sec.
Where tested: Wash. Navy Yard Date. 1923

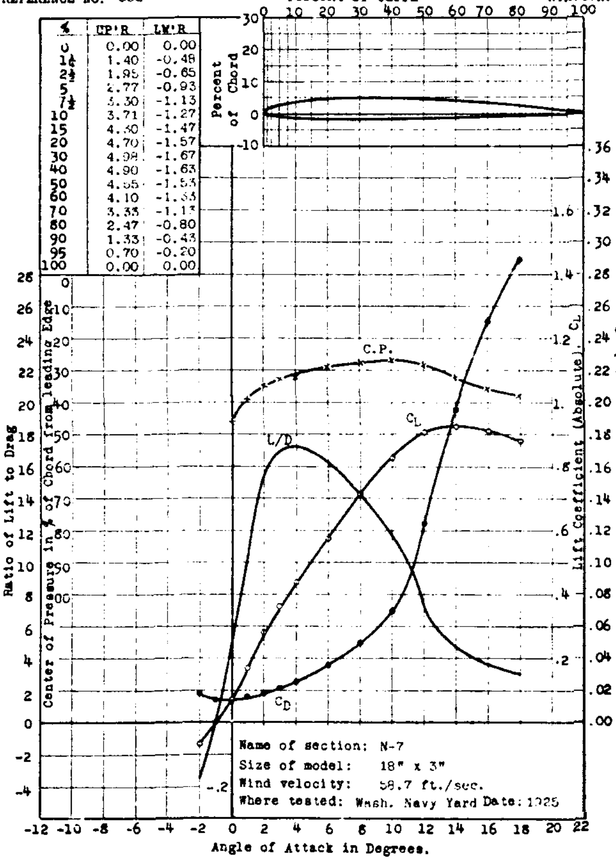
REFERENCE NO. 551



%	UP'R	LW'R
0	0.40	0.40
1¼	1.87	-0.55
2½	2.60	-0.90
5	3.60	-1.23
7½	4.23	-1.42
10	4.63	-1.56
15	5.17	-1.76
20	5.47	-1.83
30	5.47	-1.82
40	5.13	-1.73
50	4.60	-1.53
60	3.97	-1.33
70	3.27	-1.10
80	2.47	-0.83
90	1.57	-0.50
95	0.93	-0.30
100	0.12	0.12

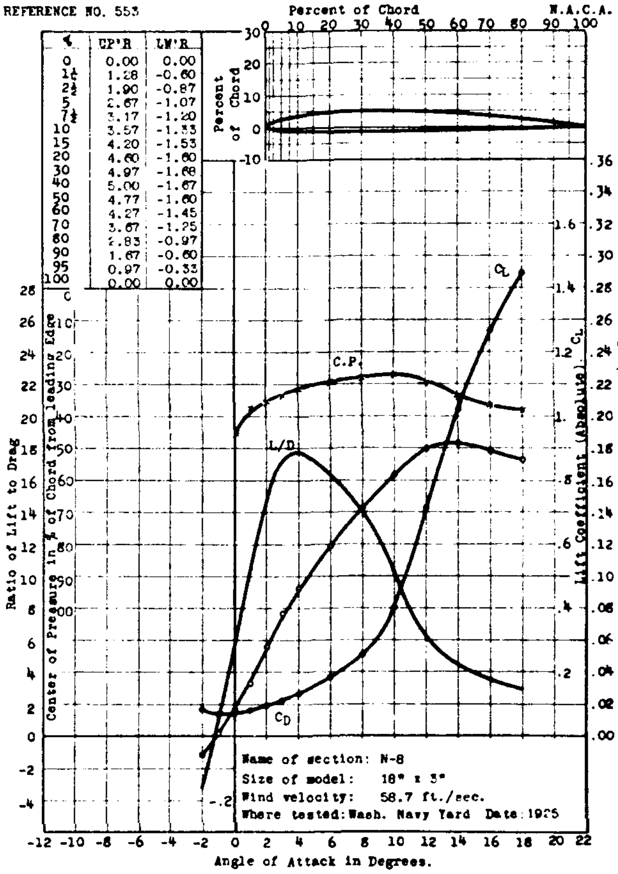
Name of section: N-6
Size of model: 18" x 3"
Wind velocity: 58.7 ft./sec.
Where tested: Wash. Navy Yard Date. 1925

REFERENCE NO. 552



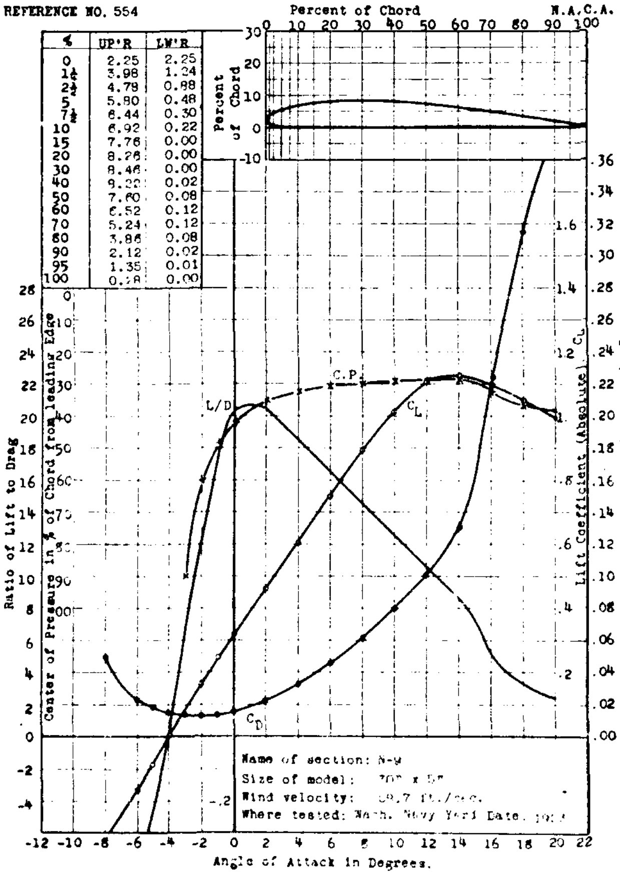
%	UP'R	LW'R
0	0.00	0.00
1¼	1.40	-0.48
2½	1.95	-0.65
5	2.77	-0.93
7½	3.30	-1.13
10	3.71	-1.27
15	4.30	-1.47
20	4.70	-1.57
30	4.98	-1.67
40	4.90	-1.63
50	4.55	-1.53
60	4.10	-1.33
70	3.33	-1.13
80	2.47	-0.80
90	1.33	-0.43
95	0.70	-0.20
100	0.00	0.00

REFERENCE NO. 553



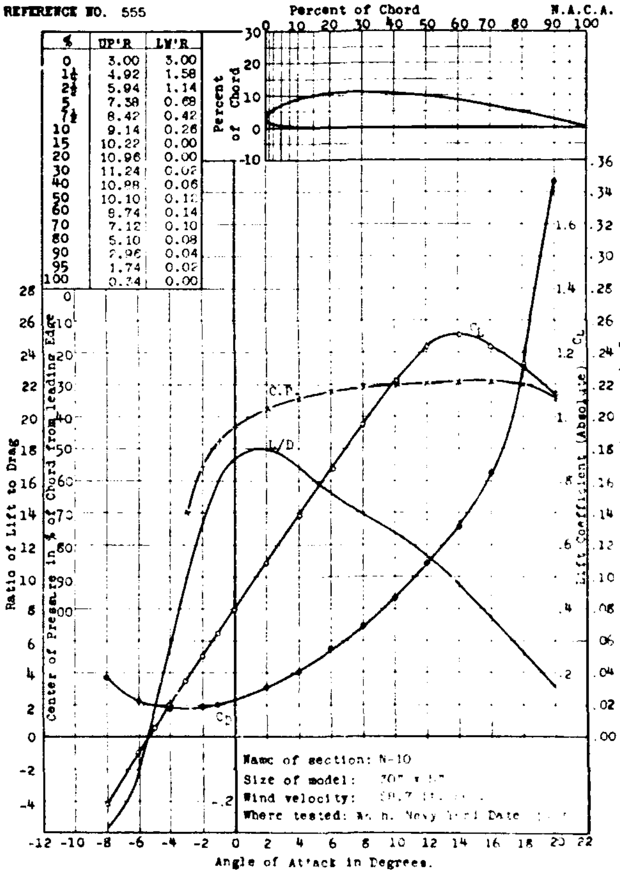
%	UP'R	LW'R
0	0.00	0.00
1¼	1.28	-0.60
2½	1.90	-0.87
5	2.67	-1.07
7½	3.17	-1.20
10	3.57	-1.33
15	4.20	-1.53
20	4.60	-1.60
30	4.97	-1.68
40	5.00	-1.67
50	4.77	-1.60
60	4.27	-1.45
70	3.67	-1.25
80	2.83	-0.97
90	1.67	-0.60
95	0.97	-0.33
100	0.00	0.00

REFERENCE NO. 554



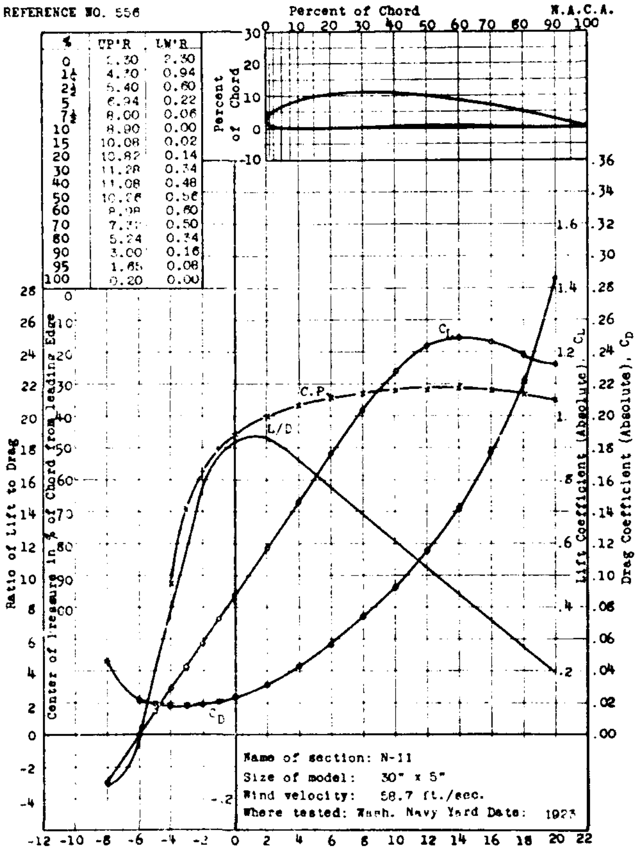
%	UP'R	LW'R
0	2.25	2.25
1¼	3.98	1.24
2½	4.78	0.88
5	5.80	0.48
7½	6.44	0.30
10	6.92	0.22
15	7.76	0.00
20	8.28	0.00
30	8.46	0.00
40	9.22	0.02
50	7.60	0.08
60	6.52	0.12
70	5.24	0.12
80	3.86	0.08
90	2.12	0.02
95	1.35	0.01
100	0.28	0.00

REFERENCE NO. 555



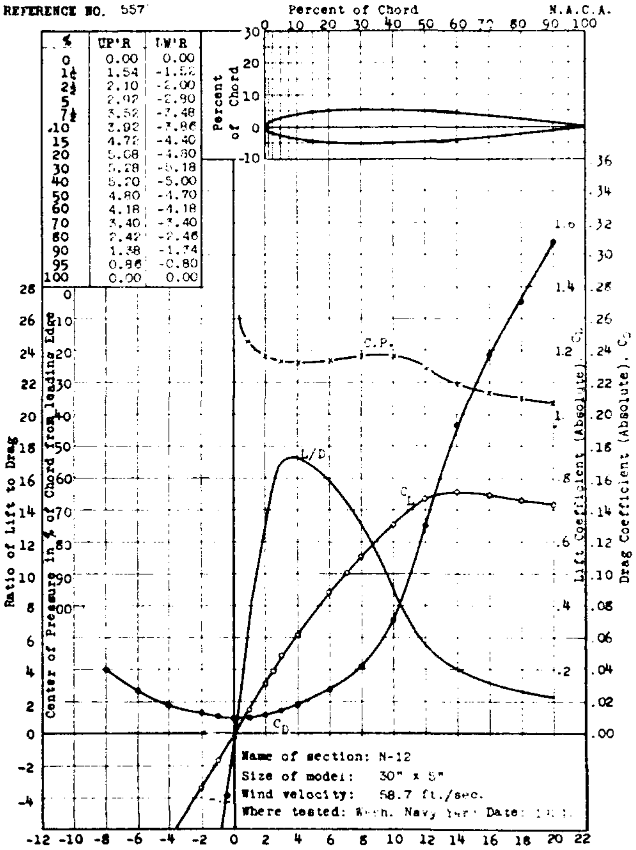
%	UP'R	LW'R
0	3.00	3.00
1¼	4.92	1.58
2½	5.94	1.14
5	7.38	0.68
7½	8.42	0.42
10	9.14	0.26
15	10.22	0.00
20	10.96	0.00
30	11.24	0.02
40	10.88	0.06
50	10.10	0.12
60	8.74	0.14
70	7.12	0.10
80	5.10	0.08
90	2.96	0.04
95	1.74	0.02
100	0.34	0.00

REFERENCE NO. 556



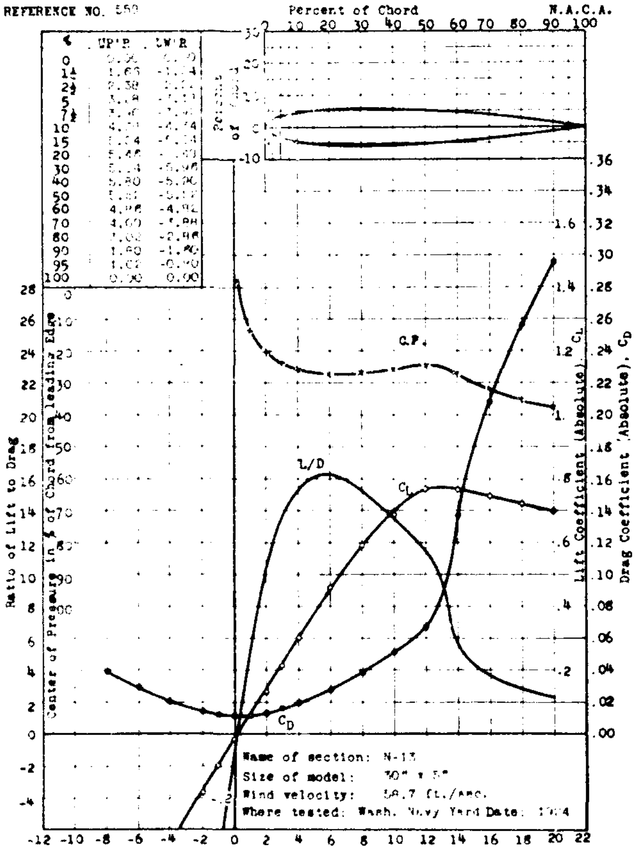
%	UP'R	LW'R
0	2.30	2.30
1¼	4.70	0.94
2½	5.40	0.60
5	6.94	0.22
7½	8.00	0.06
10	8.80	0.00
15	10.08	0.02
20	10.82	0.14
30	11.28	0.34
40	11.08	0.48
50	10.26	0.56
60	8.98	0.60
70	7.32	0.50
80	5.24	0.34
90	3.00	0.16
95	1.65	0.08
100	0.20	0.00

REFERENCE NO. 557



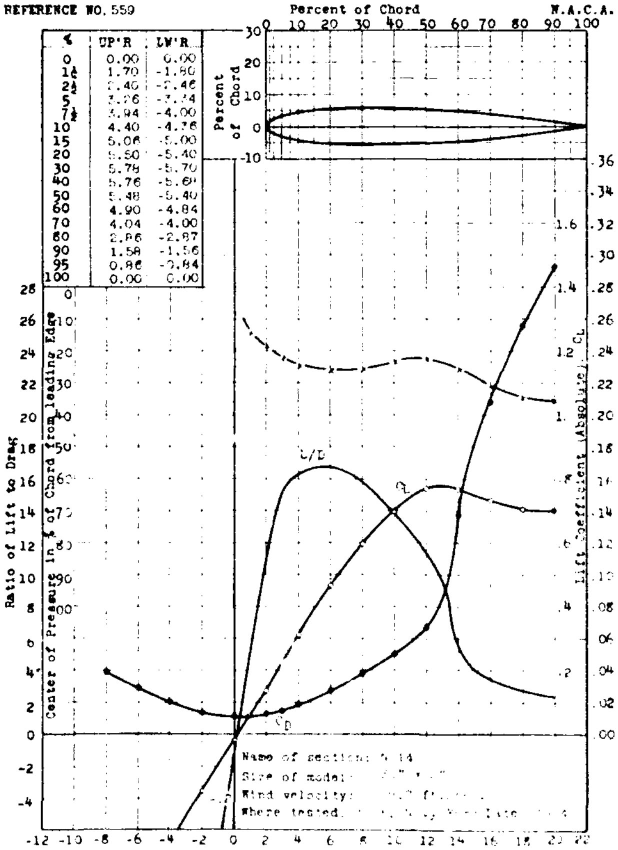
%	UP'R	LW'R
0	0.00	0.00
1¼	1.54	-1.52
2½	2.10	-2.00
5	2.92	-2.90
7½	3.52	-3.48
10	3.92	-3.86
15	4.72	-4.40
20	5.08	-4.80
30	5.28	-5.18
40	5.20	-5.00
50	4.80	-4.70
60	4.18	-4.18
70	3.40	-3.40
80	2.42	-2.46
90	1.38	-1.74
95	0.86	-0.80
100	0.00	0.00

REFERENCE NO. 558



%	UP'R	LW'R
0	[illegible]	[illegible]
1¼	1.66	[illegible]
2½	2.38	[illegible]
5	[illegible]	[illegible]
7½	[illegible]	[illegible]
10	[illegible]	-4.74
15	[illegible]	[illegible]
20	5.46	[illegible]
30	[illegible]	-5.96
40	5.80	-5.70
50	[illegible]	[illegible]
60	4.86	-4.92
70	4.00	-3.88
80	[illegible]	-2.98
90	1.80	-1.80
95	1.02	-0.90
100	0.00	0.00

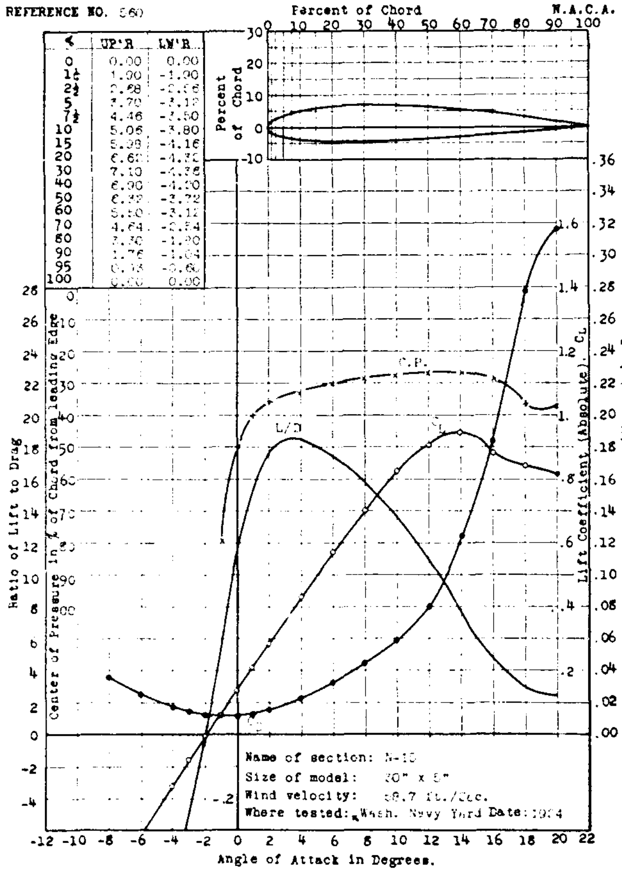
REFERENCE NO. 559



%	UP'R	LW'R
0	0.00	0.00
1¼	1.70	-1.80
2½	2.40	-2.46
5	3.26	-3.34
7½	3.94	-4.00
10	4.40	-4.76
15	5.06	-5.00
20	5.50	-5.40
30	5.78	-5.70
40	5.76	-5.60
50	5.48	-5.40
60	4.90	-4.84
70	4.04	-4.00
80	2.86	-2.87
90	1.58	-1.56
95	0.86	-0.84
100	0.00	0.00

REFERENCE NO. 560

N.A.C.A.

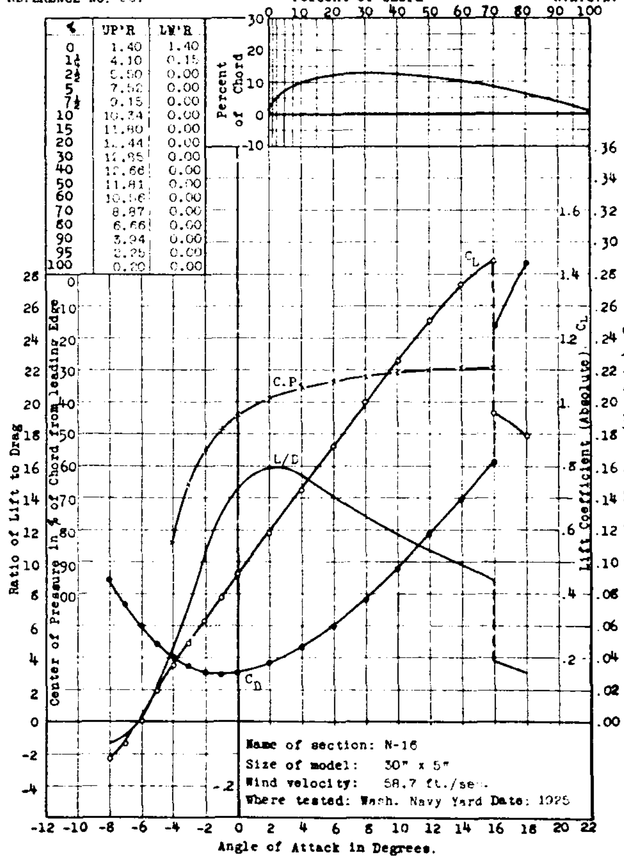


%	UP'R	LW'R
0	0.00	0.00
1¼	1.00	-1.00
2½	2.68	-2.56
5	3.70	-3.12
7½	4.46	-3.50
10	5.06	-3.80
15	5.98	-4.16
20	6.62	-4.32
30	7.10	-4.36
40	6.90	-4.20
50	6.32	-3.72
60	5.50	-3.12
70	4.64	-2.54
80	3.30	-1.90
90	1.76	-1.04
95	0.93	-0.60
100	0.00	0.00

Name of section: N-1[illegible]
Size of model: 30" x 5"
Wind velocity: 58.7 ft./sec.
Where tested: Wash. Navy Yard Date: 1924

REFERENCE NO. 561

N.A.C.A.

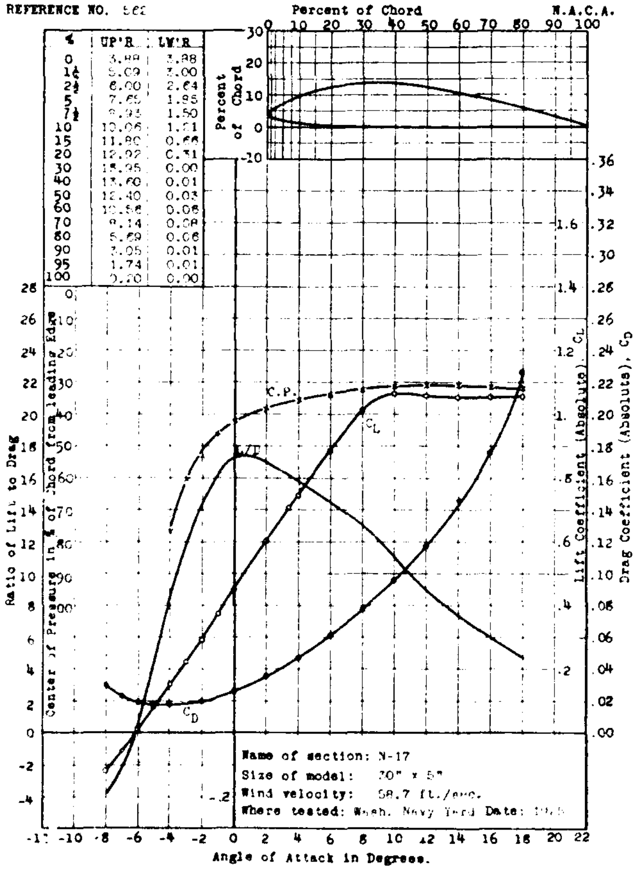


%	UP'R	LW'R
0	1.40	1.40
1¼	4.10	0.15
2½	5.50	0.00
5	7.52	0.00
7½	9.15	0.00
10	10.34	0.00
15	11.80	0.00
20	12.44	0.00
30	12.85	0.00
40	12.66	0.00
50	11.81	0.00
60	10.56	0.00
70	8.87	0.00
80	6.66	0.00
90	3.94	0.00
95	2.25	0.00
100	0.20	0.00

Name of section: N-16
Size of model: 30" x 5"
Wind velocity: 58.7 ft./sec.
Where tested: Wash. Navy Yard Date: 1925

REFERENCE NO. 562

N.A.C.A.

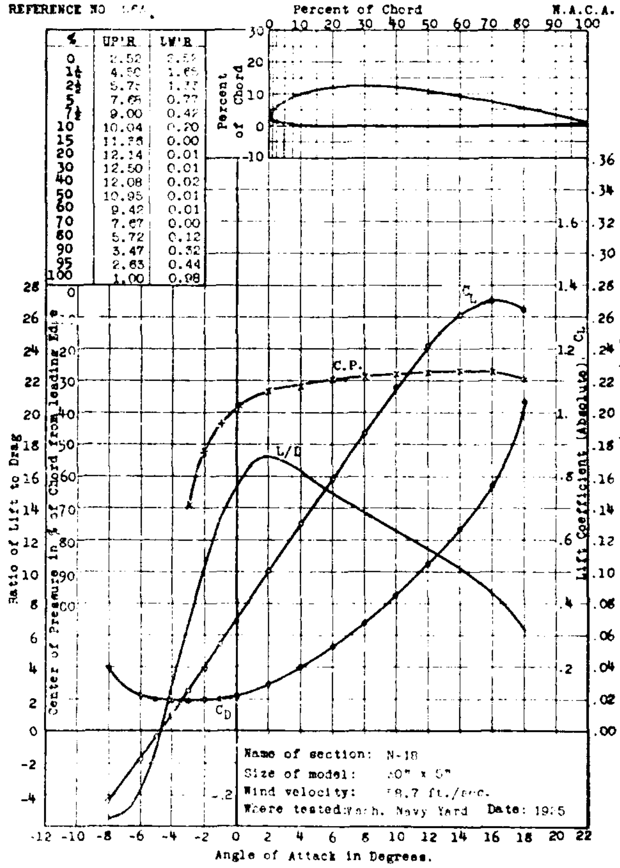


%	UP'R	LW'R
0	3.88	3.88
1¼	5.09	3.00
2½	6.00	2.64
5	7.65	1.95
7½	8.95	1.50
10	10.06	1.21
15	11.80	0.66
20	12.92	0.31
30	13.95	0.00
40	13.60	0.01
50	12.40	0.03
60	10.58	0.06
70	8.14	0.08
80	5.69	0.06
90	3.05	0.01
95	1.74	0.01
100	0.20	0.00

Name of section: N-17
Size of model: 30" x 5"
Wind velocity: 58.7 ft./sec.
Where tested: Wash. Navy Yard Date: 1925

REFERENCE NO. 56[illegible]

N.A.C.A.

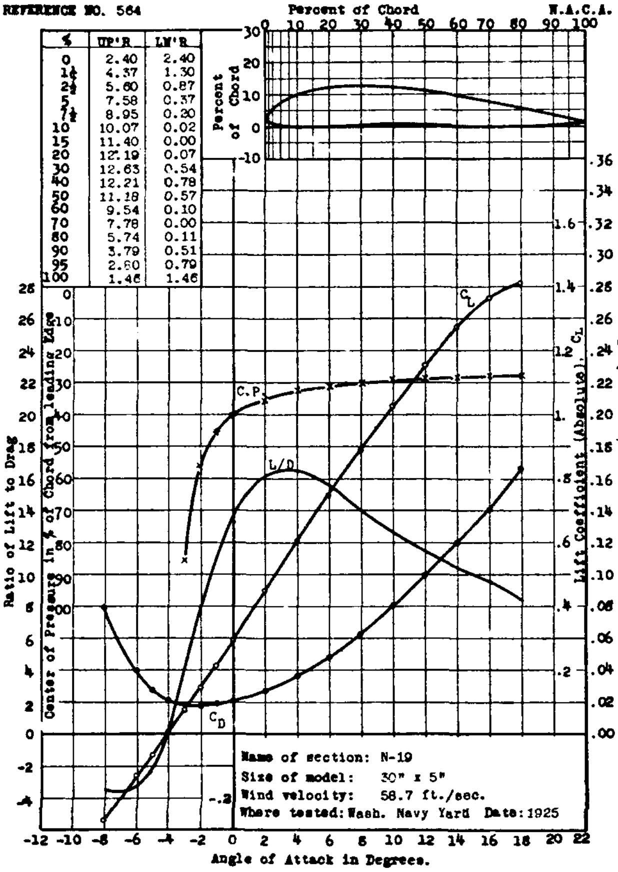


%	UP'R	LW'R
0	2.52	2.52
1¼	4.50	1.65
2½	5.75	1.27
5	7.65	0.77
7½	9.00	0.42
10	10.04	0.20
15	11.75	0.00
20	12.14	0.01
30	12.50	0.01
40	12.08	0.02
50	10.95	0.01
60	9.42	0.01
70	7.67	0.00
80	5.72	0.12
90	3.47	0.32
95	2.63	0.44
100	1.00	0.98

Name of section: N-18
Size of model: 30" x 5"
Wind velocity: 58.7 ft./sec.
Where tested: Wash. Navy Yard Date: 1925

REFERENCE NO. 564

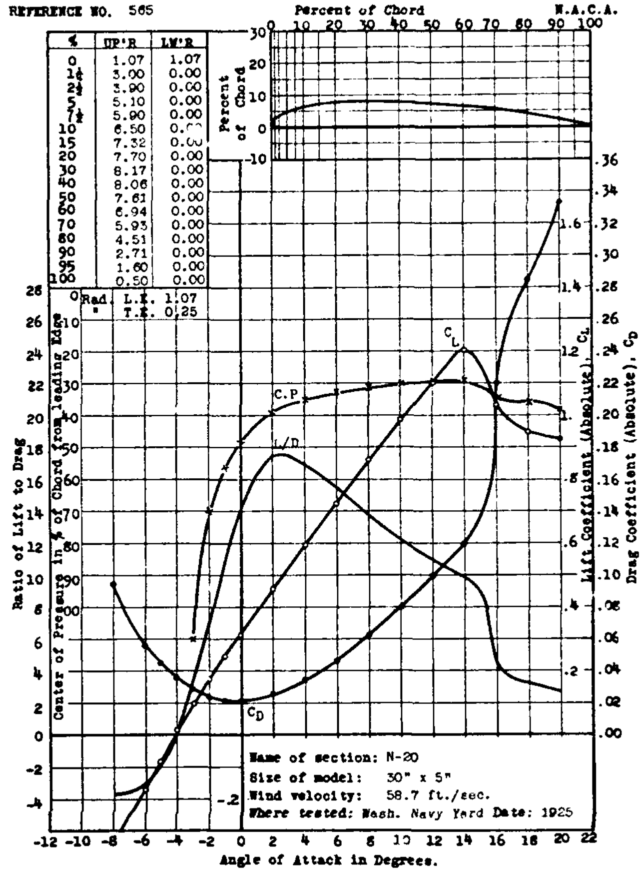
%	UP'R	LW'R
0	2.40	2.40
1¼	4.37	1.30
2½	5.60	0.87
5	7.58	0.37
7½	8.95	0.20
10	10.07	0.02
15	11.40	0.00
20	12.19	0.07
30	12.63	0.54
40	12.21	0.78
50	11.18	0.57
60	9.54	0.10
70	7.78	0.00
80	5.74	0.11
90	3.79	0.51
95	2.60	0.79
100	1.46	1.46



REFERENCE NO. 565

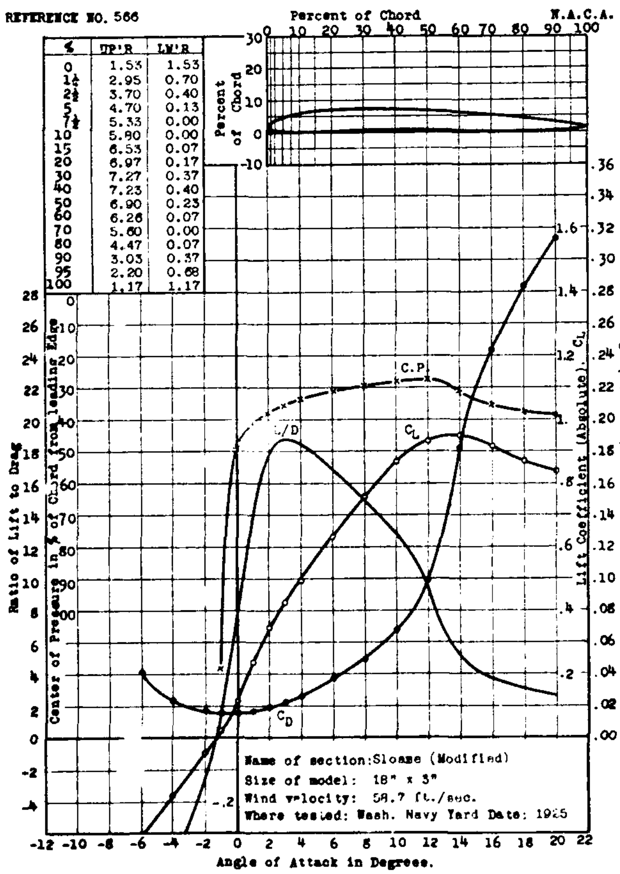
%	UP'R	LW'R
0	1.07	1.07
1¼	3.00	0.00
2½	3.90	0.00
5	5.10	0.00
7½	5.90	0.00
10	6.50	0.00
15	7.32	0.00
20	7.70	0.00
30	8.17	0.00
40	8.06	0.00
50	7.61	0.00
60	6.94	0.00
70	5.93	0.00
80	4.51	0.00
90	2.71	0.00
95	1.60	0.00
100	0.50	0.00

Rad. L.E. 1.07
" T.E. 0.25



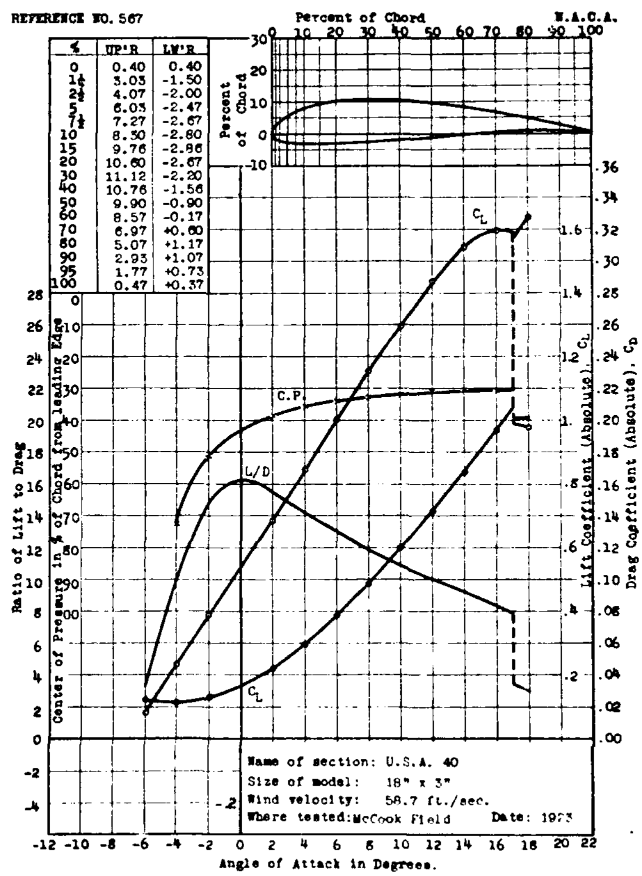
REFERENCE NO. 566

%	UP'R	LW'R
0	1.53	1.53
1¼	2.95	0.70
2½	3.70	0.40
5	4.70	0.13
7½	5.33	0.00
10	5.90	0.00
15	6.53	0.07
20	6.97	0.17
30	7.27	0.37
40	7.23	0.40
50	6.90	0.23
60	6.26	0.07
70	5.60	0.00
80	4.47	0.07
90	3.03	0.37
95	2.20	0.68
100	1.17	1.17



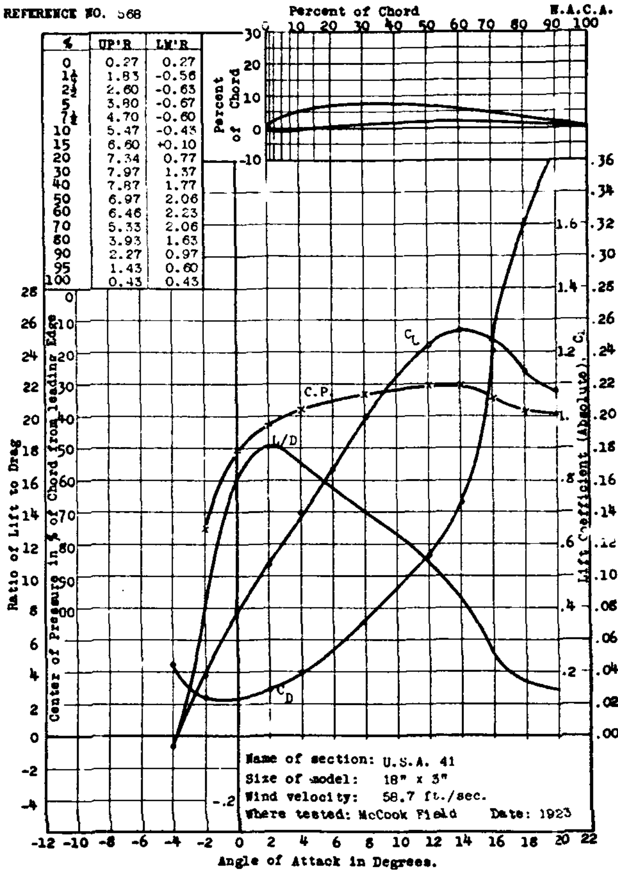
REFERENCE NO. 567

%	UP'R	LW'R
0	0.40	0.40
1¼	3.03	-1.50
2½	4.07	-2.00
5	6.03	-2.47
7½	7.27	-2.67
10	8.30	-2.80
15	9.76	-2.86
20	10.60	-2.67
30	11.12	-2.20
40	10.76	-1.56
50	9.90	-0.90
60	8.57	-0.17
70	6.97	+0.60
80	5.07	+1.17
90	2.93	+1.07
95	1.77	+0.73
100	0.47	+0.37



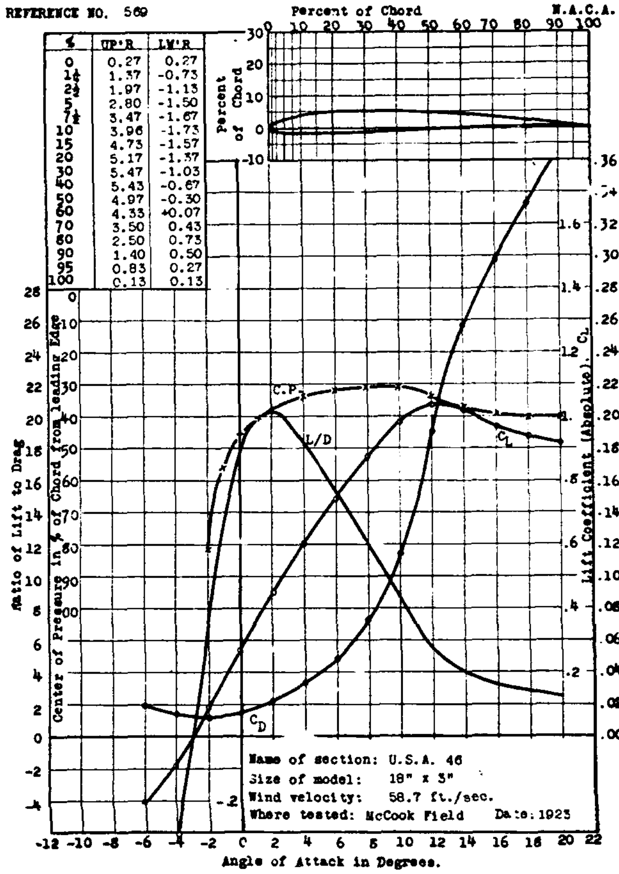
REFERENCE NO. 568

%	UP'R	LW'R
0	0.27	0.27
1¼	1.83	-0.56
2½	2.60	-0.63
5	3.90	-0.67
7½	4.70	-0.60
10	5.47	-0.43
15	6.60	+0.10
20	7.34	0.77
30	7.97	1.37
40	7.87	1.77
50	6.97	2.06
60	6.46	2.23
70	5.33	2.06
80	3.93	1.63
90	2.27	0.97
95	1.43	0.60
100	0.43	0.43



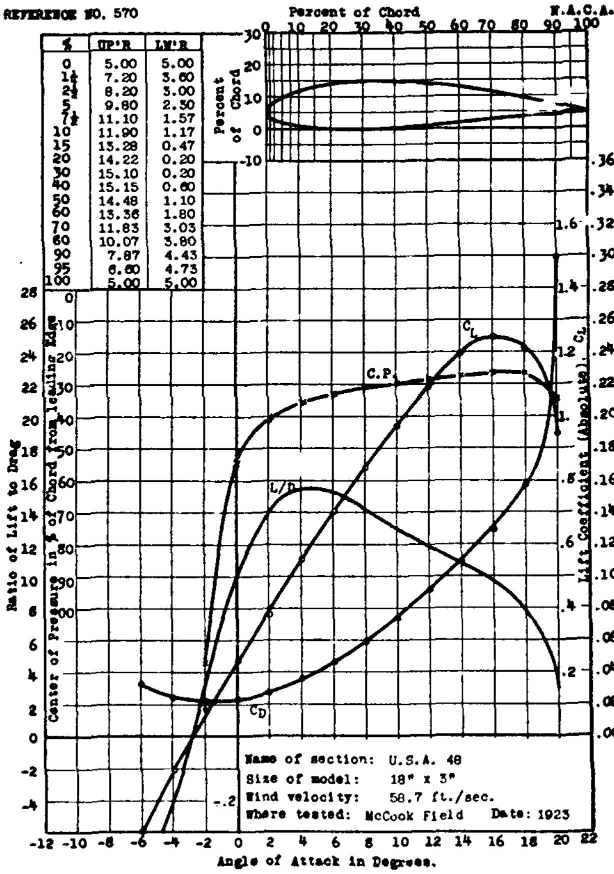
REFERENCE NO. 569

%	UP'R	LW'R
0	0.27	0.27
1¼	1.37	-0.73
2½	1.97	-1.13
5	2.80	-1.50
7½	3.47	-1.67
10	3.96	-1.73
15	4.73	-1.57
20	5.17	-1.37
30	5.47	-1.03
40	5.43	-0.67
50	4.97	-0.30
60	4.33	+0.07
70	3.50	0.43
80	2.50	0.73
90	1.40	0.50
95	0.83	0.27
100	0.13	0.13



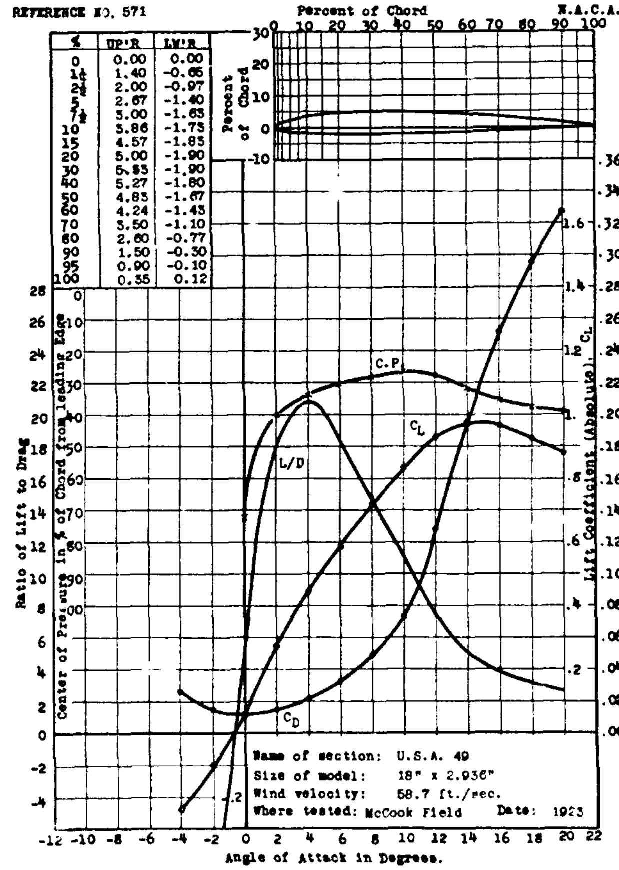
REFERENCE NO. 570

%	UP'R	LW'R
0	5.00	5.00
1¼	7.20	3.60
2½	8.20	3.00
5	9.80	2.50
7½	11.10	1.57
10	11.90	1.17
15	13.28	0.47
20	14.22	0.20
30	15.10	0.20
40	15.15	0.60
50	14.48	1.10
60	13.36	1.80
70	11.83	3.03
80	10.07	3.80
90	7.87	4.43
95	6.60	4.73
100	5.00	5.00



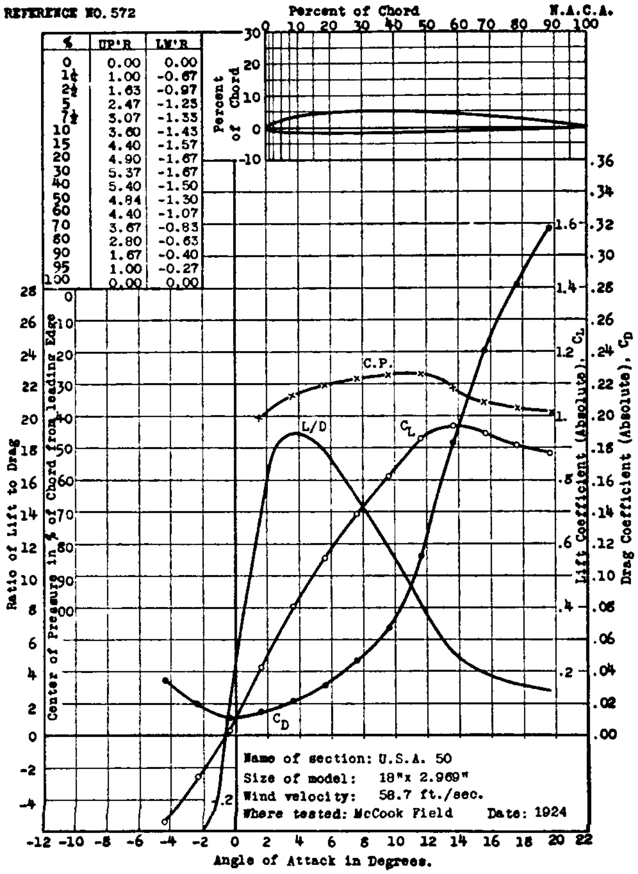
REFERENCE NO. 571

%	UP'R	LW'R
0	0.00	0.00
1¼	1.40	-0.65
2½	2.00	-0.97
5	2.67	-1.40
7½	3.00	-1.63
10	3.86	-1.73
15	4.57	-1.85
20	5.00	-1.90
30	5.33	-1.90
40	5.27	-1.80
50	4.83	-1.67
60	4.24	-1.43
70	3.50	-1.10
80	2.60	-0.77
90	1.50	-0.30
95	0.90	-0.10
100	0.35	0.12



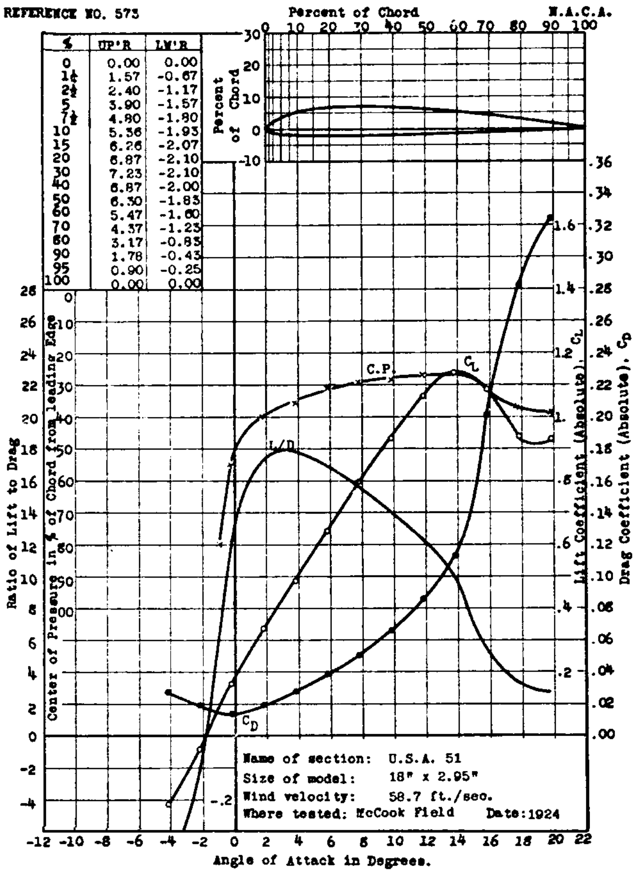
REFERENCE NO. 572

%	UP'R	LW'R
0	0.00	0.00
1¼	1.00	-0.67
2½	1.63	-0.97
5	2.47	-1.23
7½	3.07	-1.33
10	3.60	-1.43
15	4.40	-1.57
20	4.90	-1.67
30	5.37	-1.67
40	5.40	-1.50
50	4.84	-1.30
60	4.40	-1.07
70	3.67	-0.83
80	2.80	-0.63
90	1.67	-0.40
95	1.00	-0.27
100	0.00	0.00



REFERENCE NO. 573

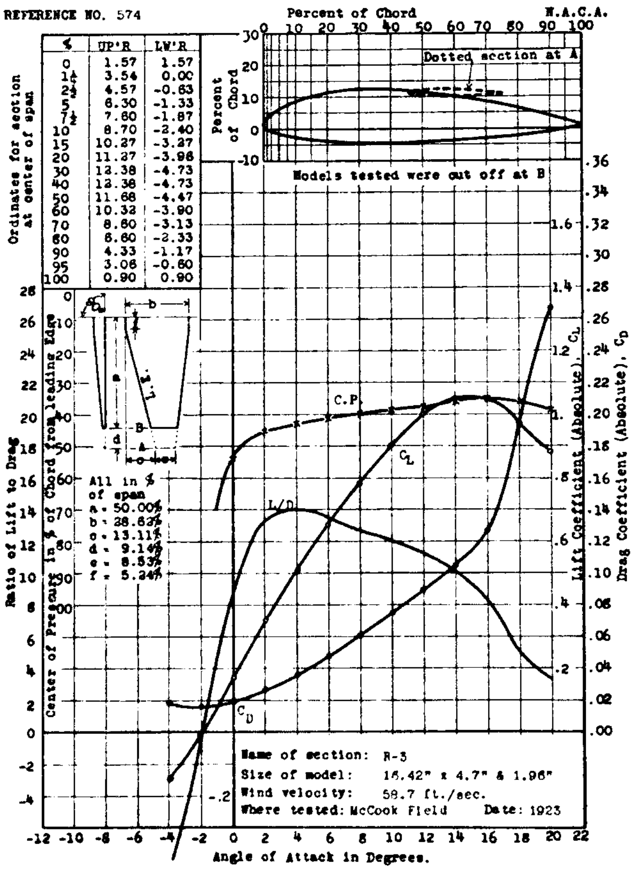
%	UP'R	LW'R
0	0.00	0.00
1¼	1.57	-0.67
2½	2.40	-1.17
5	3.90	-1.57
7½	4.80	-1.80
10	5.36	-1.93
15	6.26	-2.07
20	6.87	-2.10
30	7.23	-2.10
40	6.87	-2.00
50	6.30	-1.83
60	5.47	-1.60
70	4.37	-1.23
80	3.17	-0.83
90	1.78	-0.43
95	0.90	-0.25
100	0.00	0.00



REFERENCE NO. 574

Ordinates for section at center of span

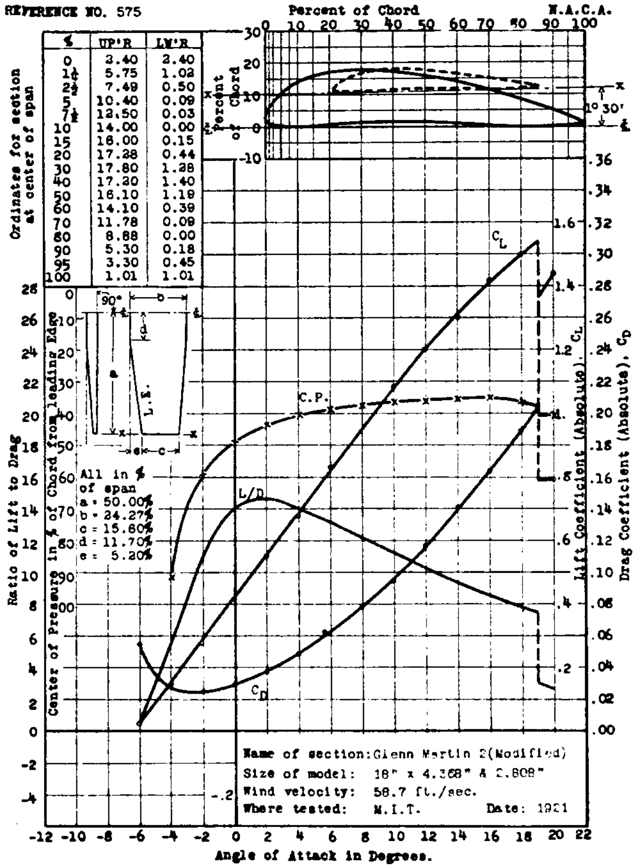
%	UP'R	LW'R
0	1.57	1.57
1¼	3.54	0.00
2½	4.57	-0.63
5	6.30	-1.33
7½	7.80	-1.87
10	8.70	-2.40
15	10.27	-3.27
20	11.27	-3.96
30	12.38	-4.73
40	12.38	-4.73
50	11.68	-4.47
60	10.32	-3.90
70	8.80	-3.13
80	6.60	-2.33
90	4.33	-1.17
95	3.06	-0.60
100	0.90	0.90



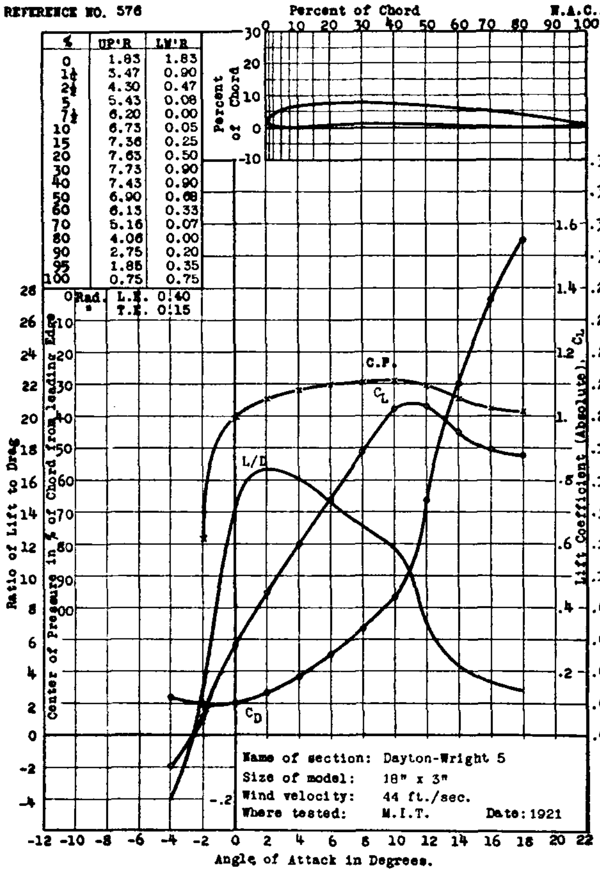
REFERENCE NO. 575

Ordinates for section at center of span

%	UP'R	LW'R
0	2.40	2.40
1¼	5.75	1.02
2½	7.49	0.50
5	10.40	0.09
7½	12.50	0.03
10	14.00	0.00
15	16.00	0.15
20	17.28	0.44
30	17.80	1.28
40	17.20	1.40
50	16.10	1.19
60	14.10	0.39
70	11.78	0.09
80	8.88	0.00
90	5.30	0.18
95	3.30	0.45
100	1.01	1.01

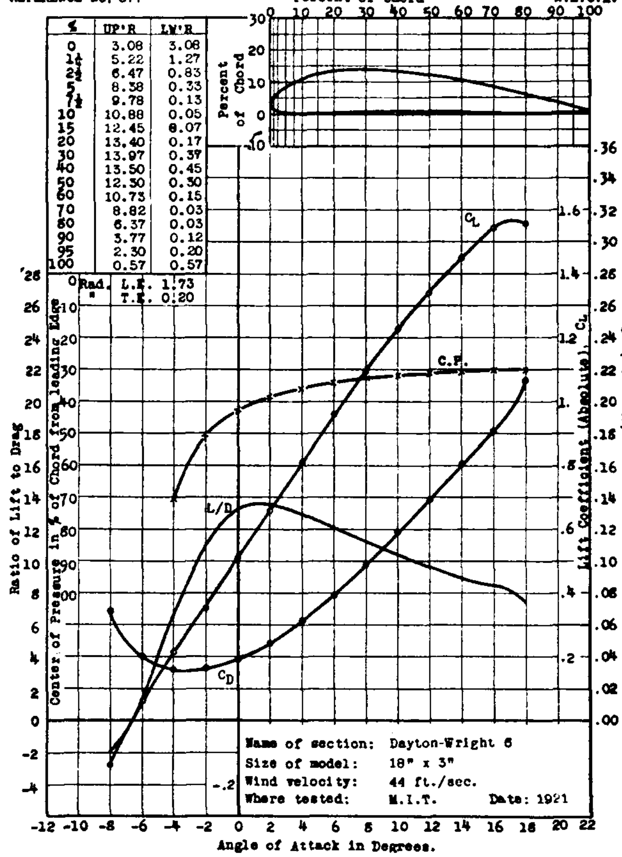


REFERENCE NO. 576



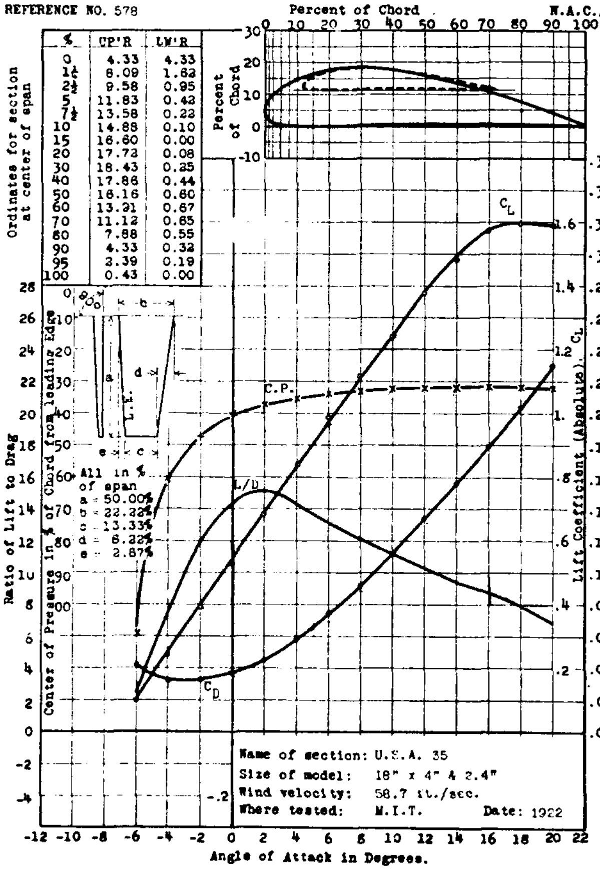
%	UP'R	LW'R
0	1.83	1.83
1¼	3.47	0.90
2½	4.30	0.47
5	5.43	0.08
7½	6.20	0.00
10	6.73	0.05
15	7.36	0.25
20	7.63	0.50
30	7.73	0.90
40	7.43	0.90
50	6.90	0.68
60	6.13	0.33
70	5.16	0.07
80	4.06	0.00
90	2.75	0.20
95	1.85	0.35
100	0.75	0.75
Rad.	L.E. 0.40	
"	T.E. 0.15	

REFERENCE NO. 577



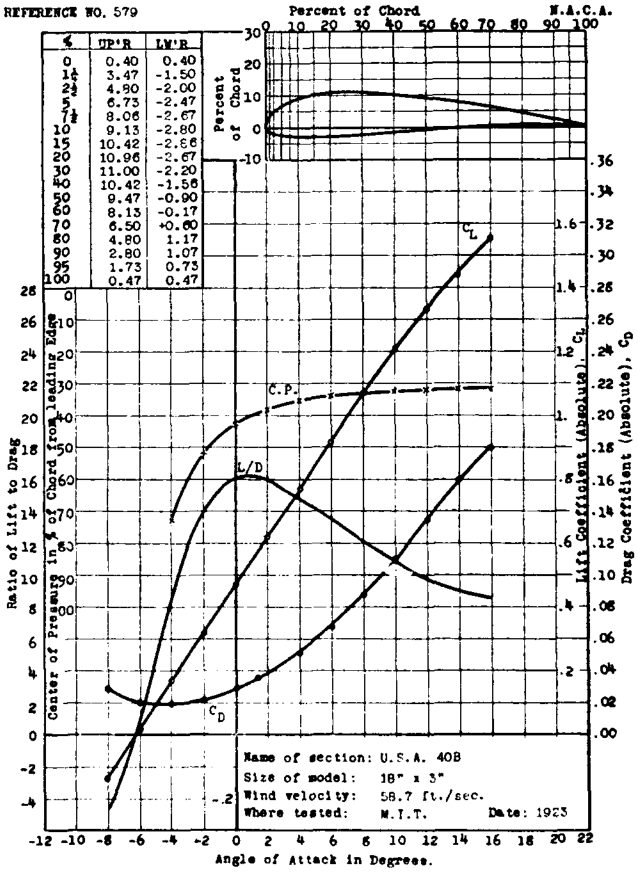
%	UP'R	LW'R
0	3.08	3.08
1¼	5.22	1.27
2½	6.47	0.83
5	8.38	0.33
7½	9.78	0.13
10	10.88	0.05
15	12.45	0.07
20	13.40	0.17
30	13.97	0.37
40	13.50	0.45
50	12.30	0.30
60	10.73	0.15
70	8.82	0.03
80	6.37	0.03
90	3.77	0.12
95	2.30	0.20
100	0.57	0.57
Rad.	L.E. 1.73	
"	T.E. 0.20	

REFERENCE NO. 578



%	UP'R	LW'R
0	4.33	4.33
1¼	6.09	1.62
2½	9.58	0.95
5	11.83	0.42
7½	13.58	0.22
10	14.88	0.10
15	16.60	0.00
20	17.72	0.08
30	18.43	0.25
40	17.86	0.44
50	16.16	0.60
60	13.21	0.67
70	11.12	0.65
80	7.88	0.55
90	4.33	0.32
95	3.39	0.19
100	0.43	0.00

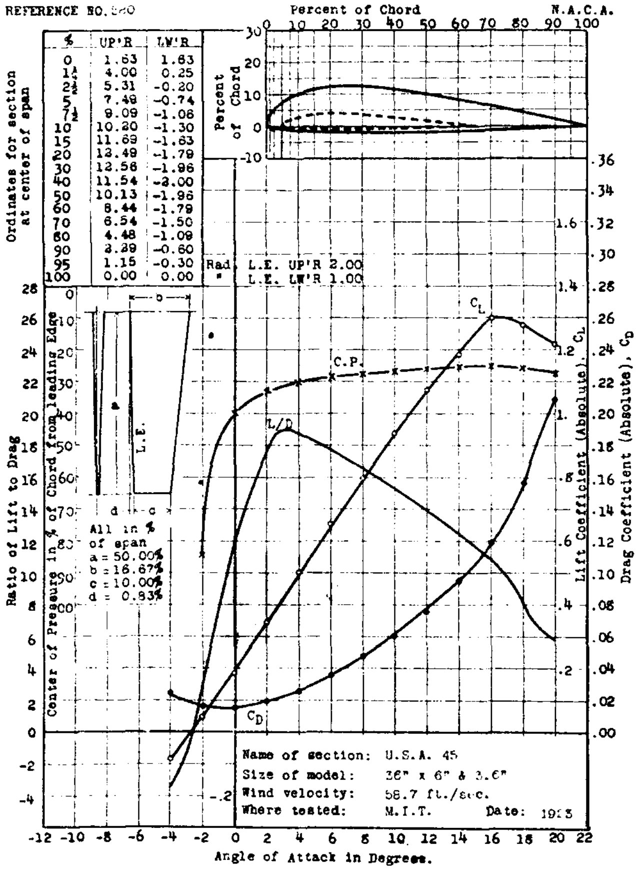
REFERENCE NO. 579



%	UP'R	LW'R
0	0.40	0.40
1¼	3.47	-1.50
2½	4.90	-2.00
5	6.73	-2.47
7½	8.06	-2.67
10	9.13	-2.80
15	10.42	-2.86
20	10.96	-2.67
30	11.00	-2.20
40	10.42	-1.56
50	9.47	-0.90
60	8.13	-0.17
70	6.50	+0.60
80	4.80	1.17
90	2.80	1.07
95	1.73	0.73
100	0.47	0.47

REFERENCE NO. 580

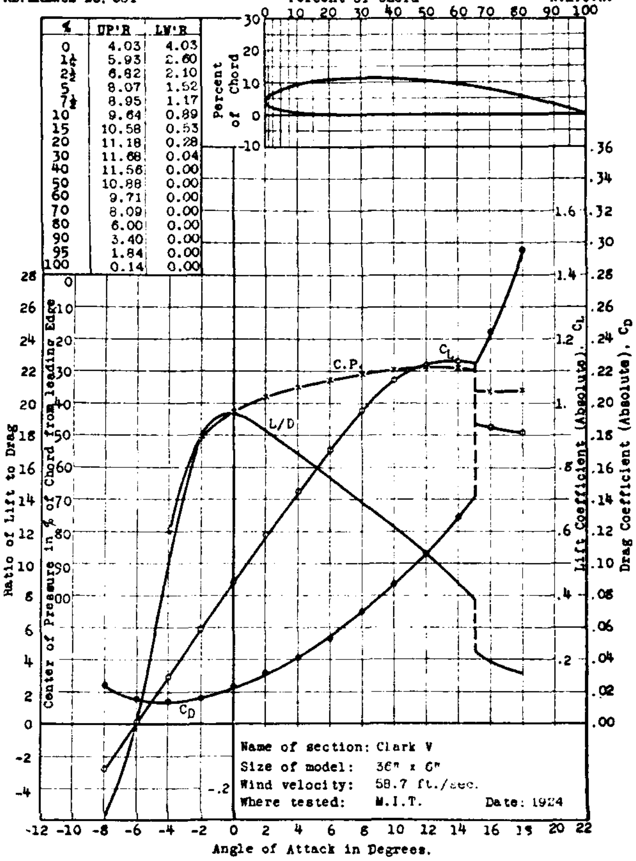
N.A.C.A.



%	UP'R	LW'R
0	1.63	1.63
1¼	4.00	0.25
2½	5.31	-0.20
5	7.48	-0.74
7½	9.09	-1.06
10	10.20	-1.30
15	11.69	-1.63
20	12.49	-1.79
30	12.56	-1.96
40	11.54	-2.00
50	10.13	-1.96
60	8.44	-1.79
70	6.54	-1.50
80	4.48	-1.09
90	2.39	-0.60
95	1.15	-0.30
100	0.00	0.00

REFERENCE NO. 581

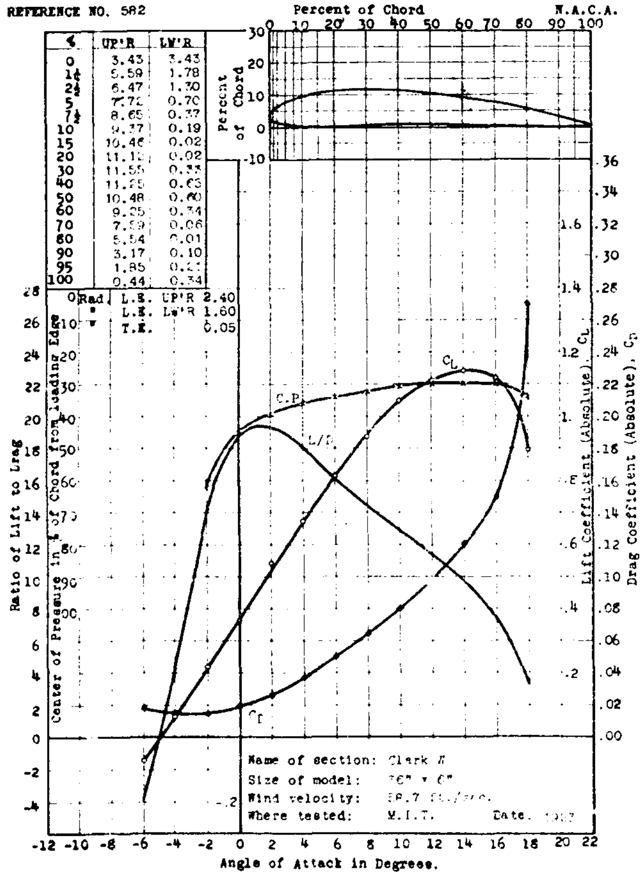
N.A.C.A.



%	UP'R	LW'R
0	4.03	4.03
1¼	5.93	2.60
2½	6.82	2.10
5	8.07	1.52
7½	8.95	1.17
10	9.64	0.89
15	10.58	0.53
20	11.18	0.28
30	11.68	0.04
40	11.56	0.00
50	10.88	0.00
60	9.71	0.00
70	8.09	0.00
80	6.00	0.00
90	3.40	0.00
95	1.84	0.00
100	0.14	0.00

REFERENCE NO. 582

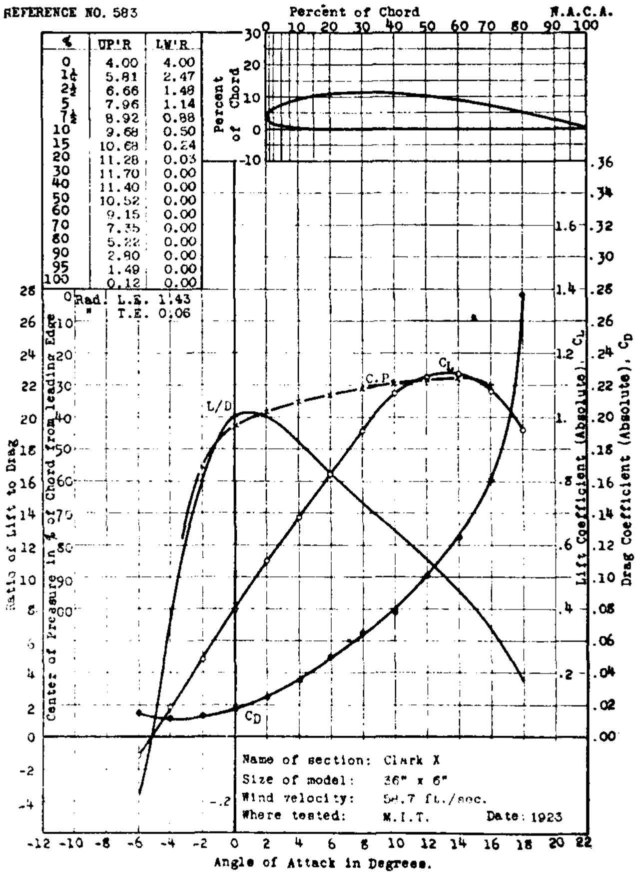
N.A.C.A.



%	UP'R	LW'R
0	3.43	3.43
1¼	5.59	1.78
2½	6.47	1.30
5	7.72	0.70
7½	8.65	0.37
10	9.37	0.19
15	10.46	0.02
20	11.12	0.02
30	11.55	0.33
40	11.25	0.63
50	10.48	0.60
60	9.25	0.34
70	7.59	0.06
80	5.54	0.01
90	3.17	0.10
95	1.85	0.21
100	0.44	0.34

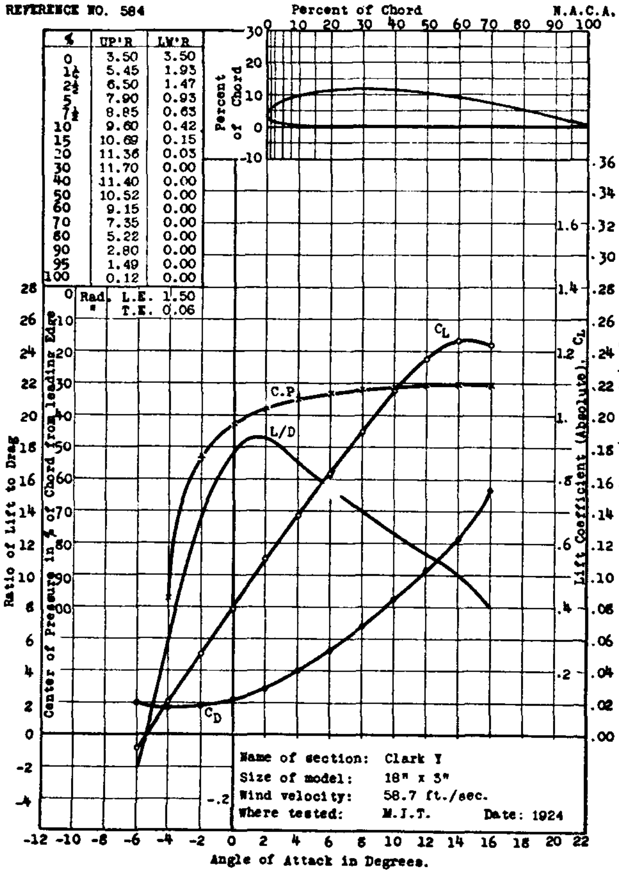
REFERENCE NO. 583

N.A.C.A.



%	UP'R	LW'R
0	4.00	4.00
1¼	5.81	2.47
2½	6.66	1.48
5	7.96	1.14
7½	8.92	0.88
10	9.68	0.50
15	10.68	0.24
20	11.28	0.03
30	11.70	0.00
40	11.40	0.00
50	10.52	0.00
60	9.15	0.00
70	7.35	0.00
80	5.22	0.00
90	2.90	0.00
95	1.49	0.00
100	0.12	0.00

REFERENCE NO. 584

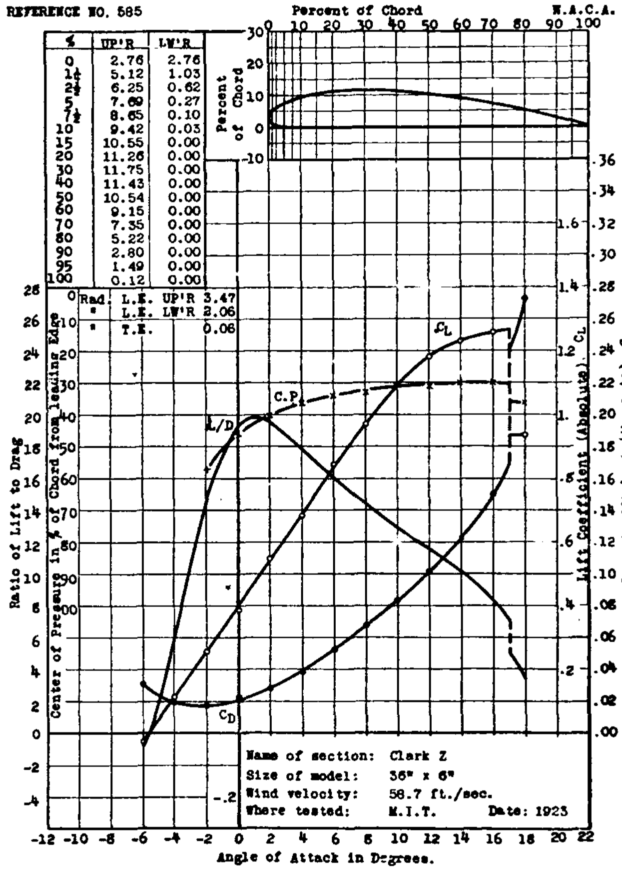


%	UP'R	LW'R
0	3.50	3.50
1¼	5.45	1.93
2½	6.50	1.47
5	7.90	0.93
7½	8.85	0.63
10	9.60	0.42
15	10.69	0.15
20	11.36	0.03
30	11.70	0.00
40	11.40	0.00
50	10.52	0.00
60	9.15	0.00
70	7.35	0.00
80	5.22	0.00
90	2.80	0.00
95	1.49	0.00
100	0.12	0.00

Rad. L.E. 1.50
" T.E. 0.06

Name of section: Clark Y
Size of model: 18" x 3"
Wind velocity: 58.7 ft./sec.
Where tested: M.I.T. Date: 1924

REFERENCE NO. 585

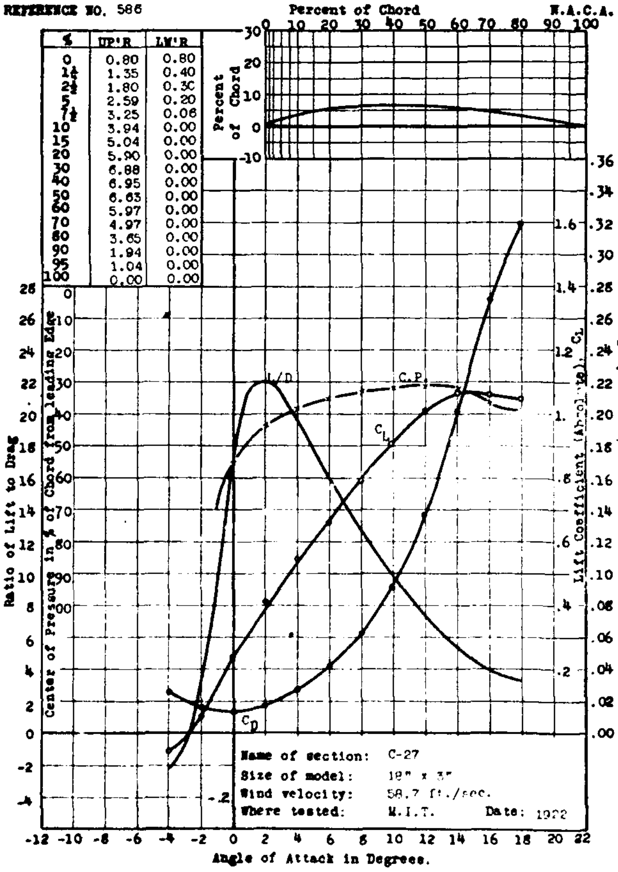


%	UP'R	LW'R
0	2.76	2.76
1¼	5.12	1.03
2½	6.25	0.62
5	7.69	0.27
7½	8.65	0.10
10	9.42	0.03
15	10.55	0.00
20	11.26	0.00
30	11.75	0.00
40	11.43	0.00
50	10.54	0.00
60	9.15	0.00
70	7.35	0.00
80	5.22	0.00
90	2.80	0.00
95	1.49	0.00
100	0.12	0.00

Rad. L.E. UP'R 3.47
" L.E. LW'R 2.06
" T.E. 0.06

Name of section: Clark Z
Size of model: 36" x 6"
Wind velocity: 58.7 ft./sec.
Where tested: M.I.T. Date: 1923

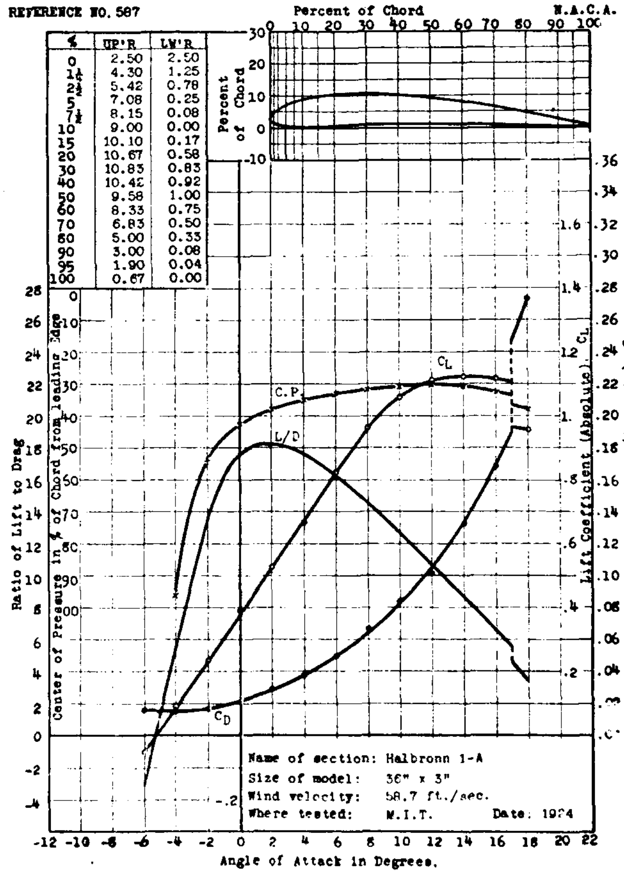
REFERENCE NO. 586



%	UP'R	LW'R
0	0.80	0.80
1¼	1.35	0.40
2½	1.80	0.30
5	2.59	0.20
7½	3.25	0.06
10	3.94	0.00
15	5.04	0.00
20	5.90	0.00
30	6.88	0.00
40	6.95	0.00
50	6.63	0.00
60	5.97	0.00
70	4.97	0.00
80	3.65	0.00
90	1.94	0.00
95	1.04	0.00
100	0.00	0.00

Name of section: C-27
Size of model: 18" x 3"
Wind velocity: 58.7 ft./sec.
Where tested: M.I.T. Date: 1922

REFERENCE NO. 587

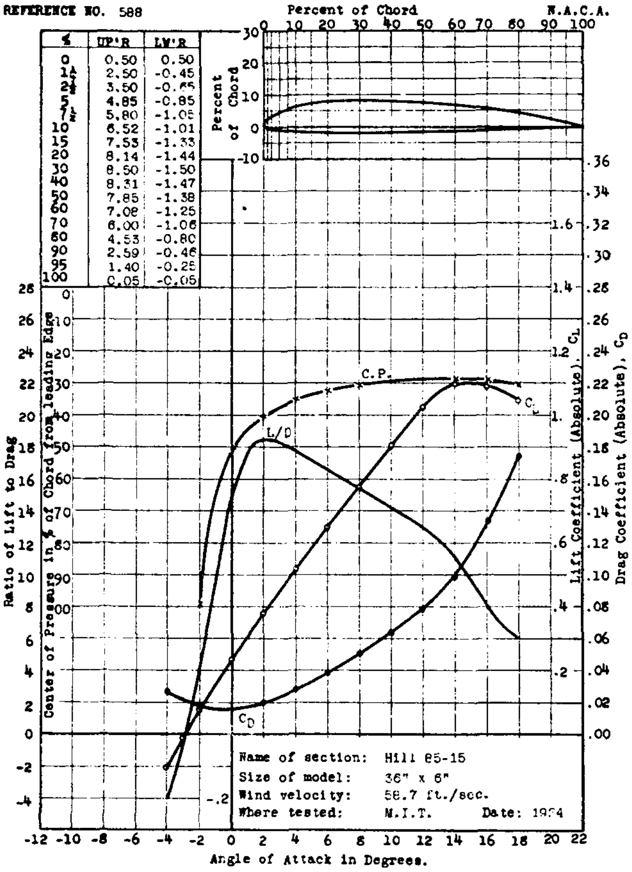


%	UP'R	LW'R
0	2.50	2.50
1¼	4.30	1.25
2½	5.42	0.78
5	7.08	0.25
7½	8.15	0.08
10	9.00	0.00
15	10.10	0.17
20	10.67	0.58
30	10.83	0.83
40	10.42	0.92
50	9.58	1.00
60	8.33	0.75
70	6.83	0.50
80	5.00	0.33
90	3.00	0.08
95	1.90	0.04
100	0.67	0.00

Name of section: Halbronn 1-A
Size of model: 36" x 3"
Wind velocity: 58.7 ft./sec.
Where tested: M.I.T. Date: 1924

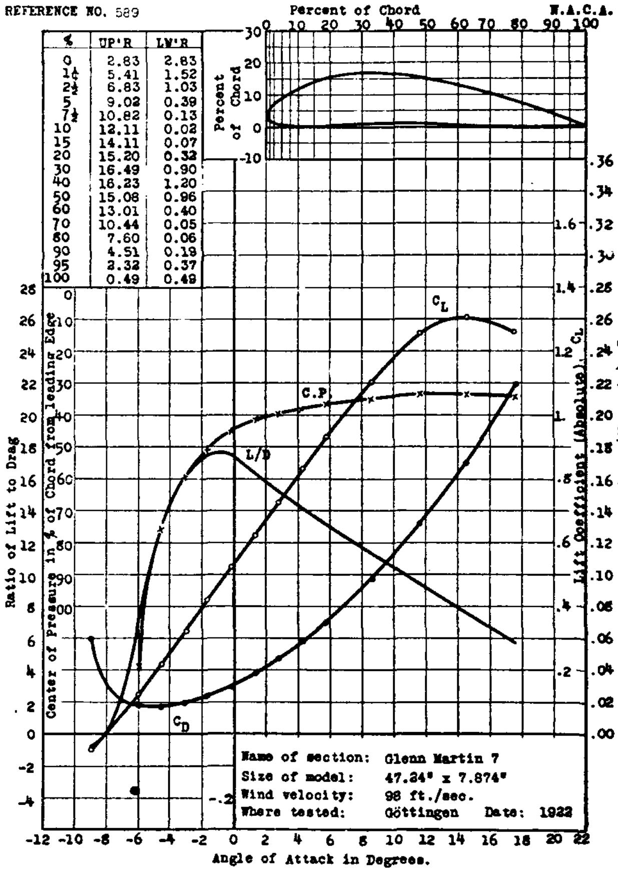
REFERENCE NO. 588

%	UP'R	LW'R
0	0.50	0.50
1¼	2.50	-0.45
2½	3.50	-0.65
5	4.85	-0.85
7½	5.80	-1.05
10	6.52	-1.01
15	7.53	-1.33
20	8.14	-1.44
30	8.50	-1.50
40	8.31	-1.47
50	7.85	-1.38
60	7.08	-1.25
70	6.00	-1.06
80	4.53	-0.80
90	2.59	-0.46
95	1.40	-0.25
100	0.05	-0.05



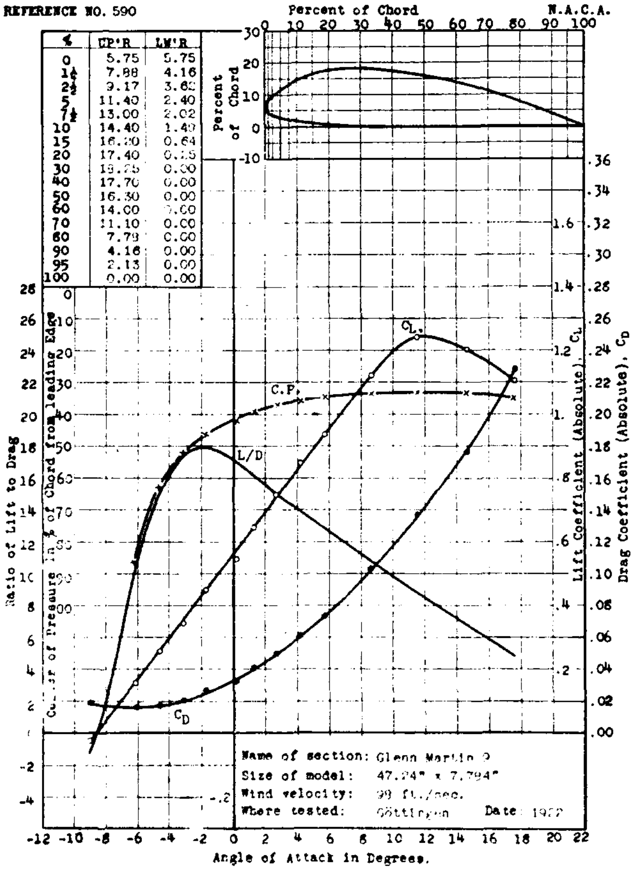
REFERENCE NO. 589

%	UP'R	LW'R
0	2.83	2.83
1¼	5.41	1.52
2½	6.83	1.03
5	9.02	0.39
7½	10.82	0.13
10	12.11	0.02
15	14.11	0.07
20	15.20	0.32
30	16.49	0.90
40	16.23	1.20
50	15.08	0.96
60	13.01	0.40
70	10.44	0.05
80	7.60	0.06
90	4.51	0.19
95	2.32	0.37
100	0.49	0.49



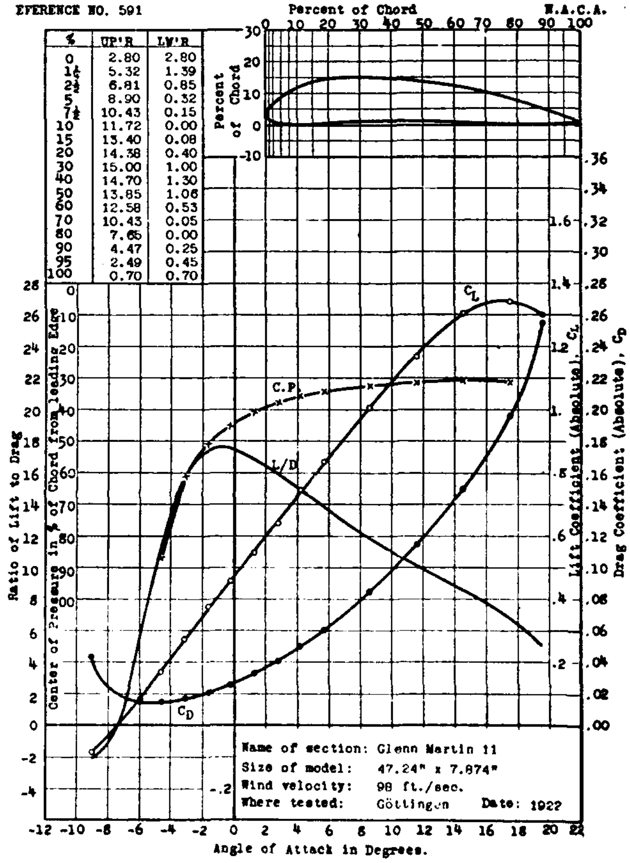
REFERENCE NO. 590

%	UP'R	LW'R
0	5.75	5.75
1¼	7.88	4.16
2½	9.17	3.62
5	11.40	2.40
7½	13.00	2.02
10	14.40	1.40
15	16.20	0.64
20	17.40	0.15
30	19.75	0.00
40	17.70	0.00
50	16.30	0.00
60	14.00	0.00
70	11.10	0.00
80	7.79	0.00
90	4.16	0.00
95	2.13	0.00
100	0.00	0.00



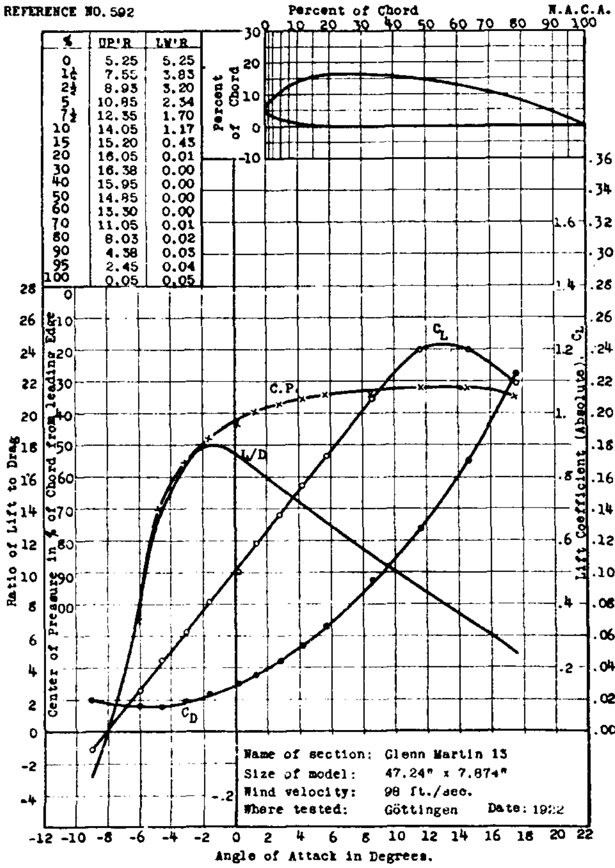
REFERENCE NO. 591

%	UP'R	LW'R
0	2.80	2.80
1¼	5.32	1.39
2½	6.81	0.85
5	8.90	0.32
7½	10.43	0.15
10	11.72	0.00
15	13.40	0.08
20	14.38	0.40
30	15.00	1.00
40	14.70	1.30
50	13.85	1.06
60	12.58	0.53
70	10.43	0.05
80	7.65	0.00
90	4.47	0.25
95	2.49	0.45
100	0.70	0.70



REFERENCE NO. 592

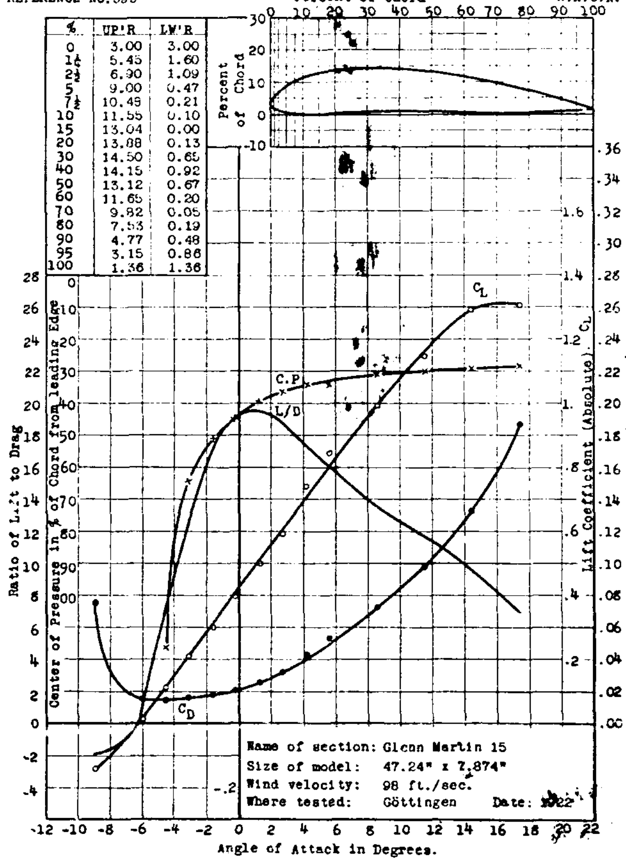
%	UP'R	LW'R
0	5.25	5.25
1¼	7.55	3.83
2½	8.93	3.20
5	10.85	2.34
7½	12.35	1.70
10	14.05	1.17
15	15.20	0.43
20	16.05	0.01
30	16.38	0.00
40	15.95	0.00
50	14.85	0.00
60	13.30	0.00
70	11.05	0.01
80	8.03	0.02
90	4.38	0.03
95	2.45	0.04
100	0.05	0.05



Name of section: Glenn Martin 13
Size of model: 47.24" x 7.874"
Wind velocity: 98 ft./sec.
Where tested: Göttingen
Date: 1922

REFERENCE NO. 593

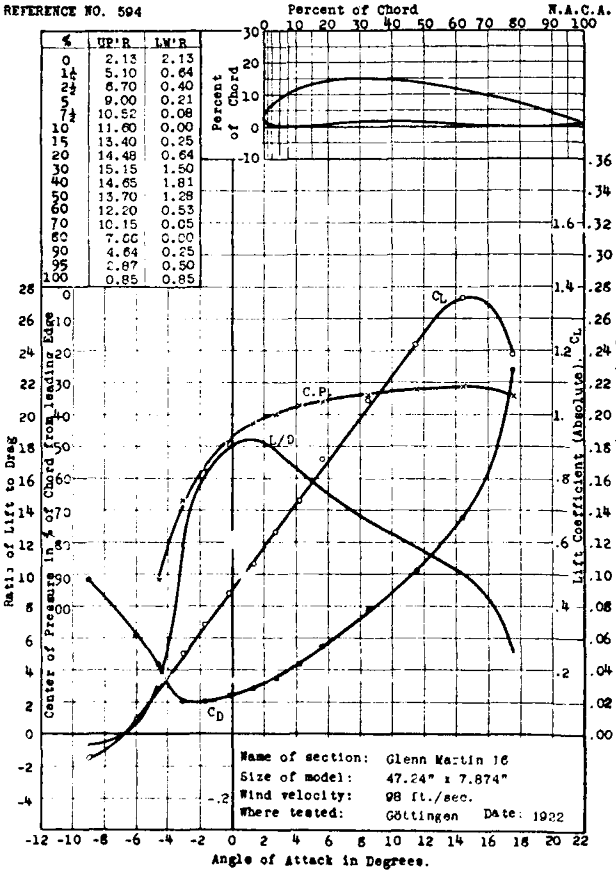
%	UP'R	LW'R
0	3.00	3.00
1¼	5.45	1.60
2½	6.90	1.09
5	9.00	0.47
7½	10.49	0.21
10	11.55	0.10
15	13.04	0.00
20	13.88	0.13
30	14.50	0.65
40	14.15	0.92
50	13.12	0.67
60	11.65	0.20
70	9.82	0.05
80	7.53	0.19
90	4.77	0.48
95	3.15	0.86
100	1.36	1.36



Name of section: Glenn Martin 15
Size of model: 47.24" x 7.874"
Wind velocity: 98 ft./sec.
Where tested: Göttingen
Date: 1922

REFERENCE NO. 594

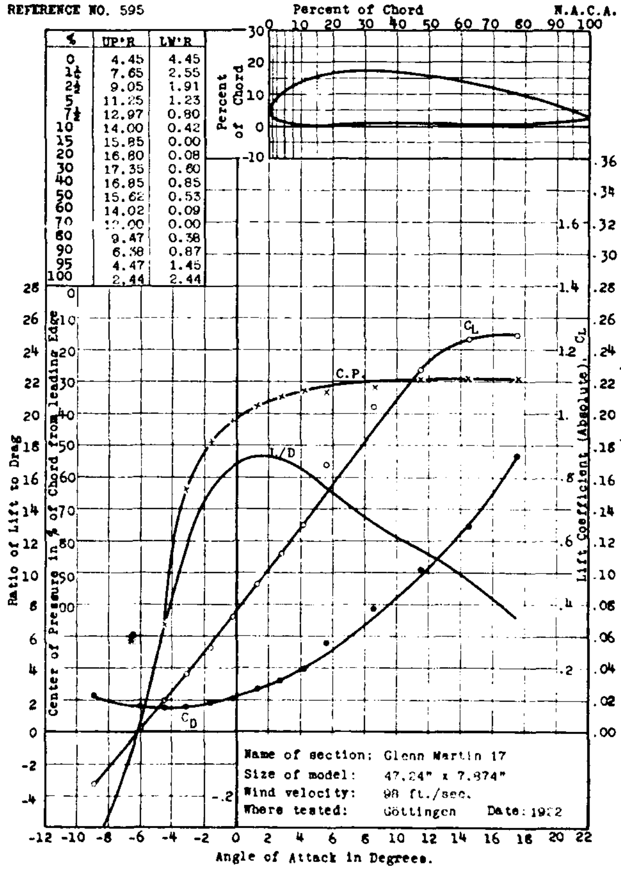
%	UP'R	LW'R
0	2.13	2.13
1¼	5.10	0.64
2½	6.70	0.40
5	9.00	0.21
7½	10.52	0.08
10	11.60	0.00
15	13.40	0.25
20	14.48	0.64
30	15.15	1.50
40	14.65	1.81
50	13.70	1.28
60	12.20	0.53
70	10.15	0.05
80	7.00	0.00
90	4.64	0.25
95	2.87	0.50
100	0.85	0.85



Name of section: Glenn Martin 16
Size of model: 47.24" x 7.874"
Wind velocity: 98 ft./sec.
Where tested: Göttingen
Date: 1922

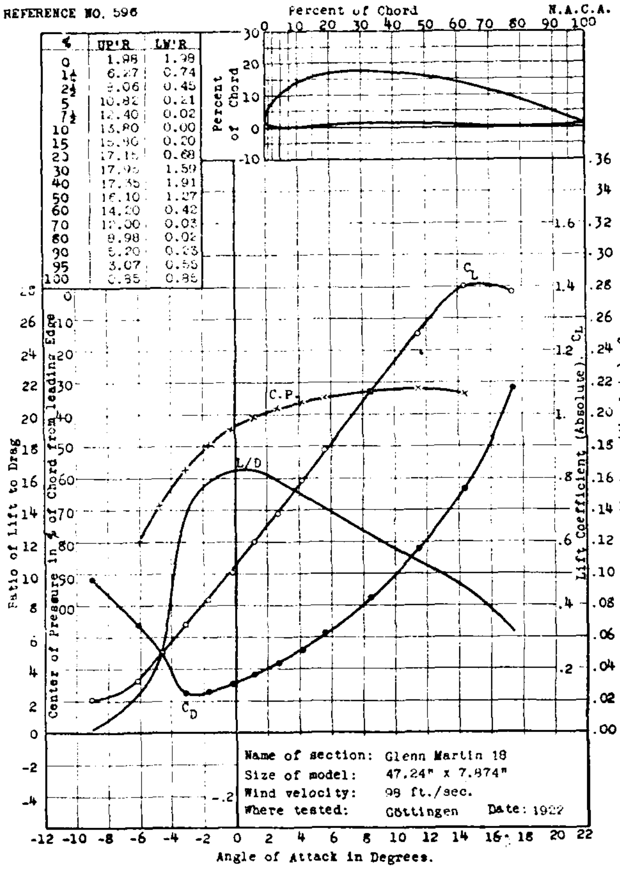
REFERENCE NO. 595

%	UP'R	LW'R
0	4.45	4.45
1¼	7.65	2.55
2½	9.05	1.91
5	11.25	1.23
7½	12.97	0.80
10	14.00	0.42
15	15.85	0.00
20	16.80	0.08
30	17.35	0.60
40	16.85	0.85
50	15.62	0.53
60	14.02	0.09
70	12.00	0.00
80	9.47	0.38
90	6.38	0.87
95	4.47	1.45
100	2.44	2.44



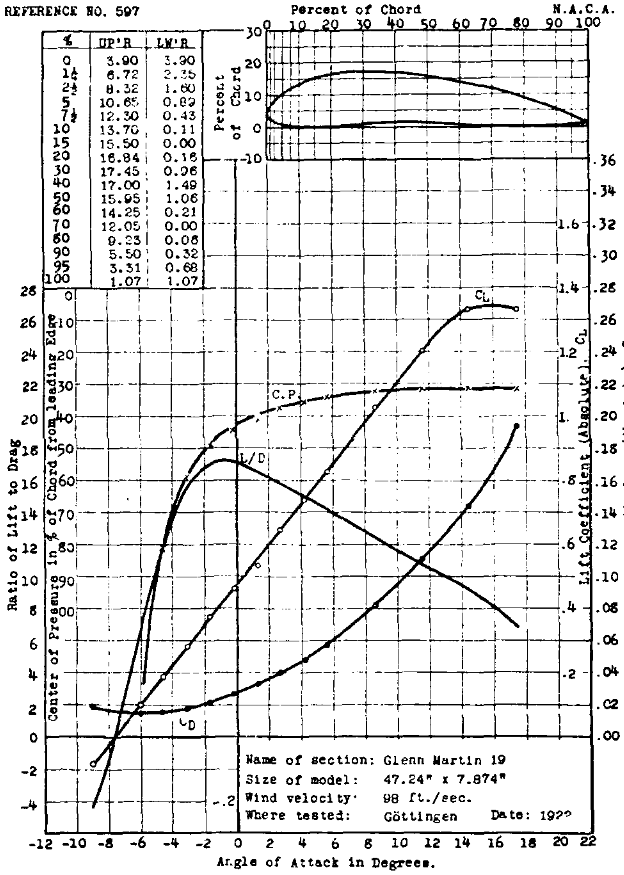
Name of section: Glenn Martin 17
Size of model: 47.24" x 7.874"
Wind velocity: 98 ft./sec.
Where tested: Göttingen
Date: 1922

REFERENCE NO. 596



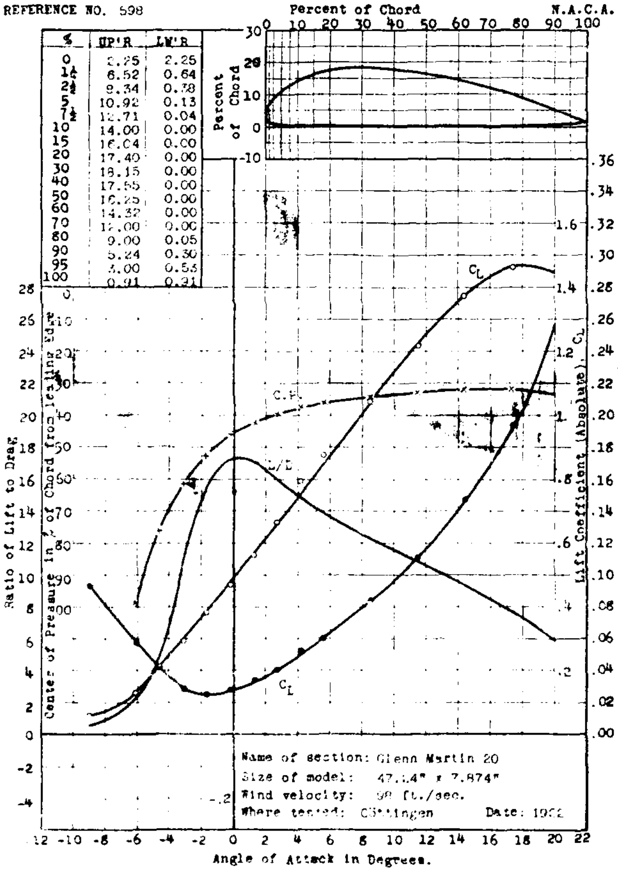
%	UP'R	LW'R
0	1.98	1.98
1¼	6.27	0.74
2½	8.06	0.45
5	10.82	0.21
7½	12.40	0.02
10	13.80	0.00
15	15.90	0.20
20	17.15	0.68
30	17.95	1.59
40	17.35	1.91
50	16.10	1.27
60	14.20	0.42
70	12.00	0.03
80	8.98	0.02
90	5.20	0.23
95	3.07	0.55
100	0.85	0.85

REFERENCE NO. 597



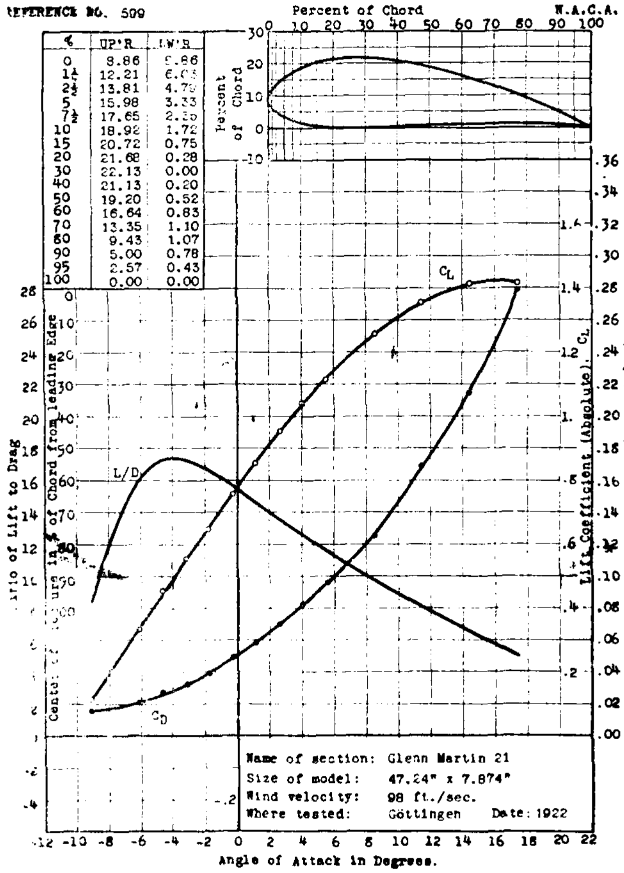
%	UP'R	LW'R
0	3.90	3.90
1¼	6.72	2.35
2½	8.32	1.60
5	10.65	0.89
7½	12.30	0.43
10	13.70	0.11
15	15.50	0.00
20	16.84	0.16
30	17.45	0.06
40	17.00	1.49
50	15.95	1.06
60	14.25	0.21
70	12.05	0.00
80	9.23	0.08
90	5.50	0.32
95	3.31	0.68
100	1.07	1.07

REFERENCE NO. 598



%	UP'R	LW'R
0	2.25	2.25
1¼	6.52	0.64
2½	8.34	0.38
5	10.92	0.13
7½	12.71	0.04
10	14.00	0.00
15	16.04	0.00
20	17.40	0.00
30	18.15	0.00
40	17.55	0.00
50	16.25	0.00
60	14.32	0.00
70	12.00	0.00
80	9.00	0.05
90	5.24	0.30
95	3.00	0.55
100	0.91	0.91

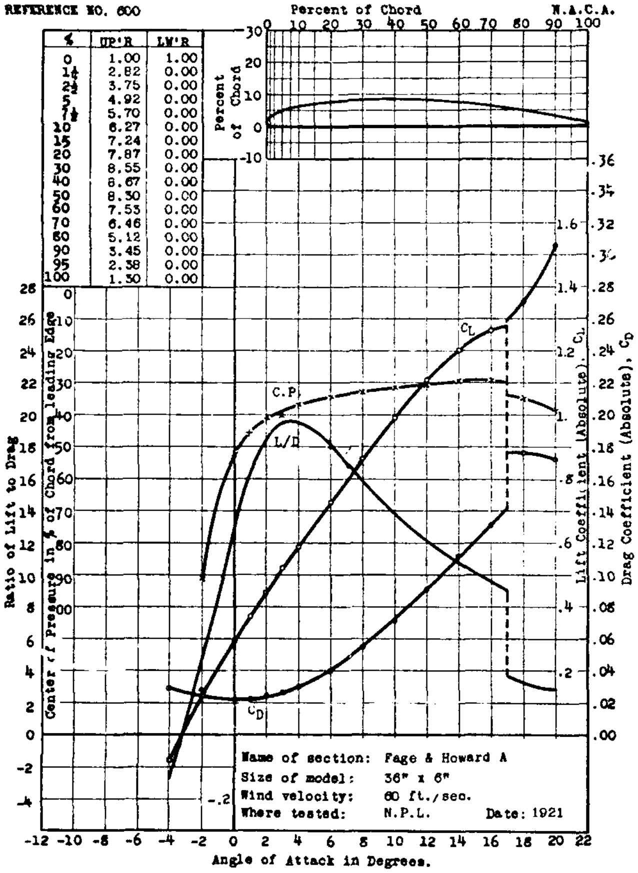
REFERENCE NO. 599



%	UP'R	LW'R
0	8.86	8.86
1¼	12.21	6.03
2½	13.81	4.79
5	15.98	3.33
7½	17.65	2.35
10	18.92	1.72
15	20.72	0.75
20	21.68	0.28
30	22.13	0.00
40	21.13	0.20
50	19.20	0.52
60	16.64	0.83
70	13.35	1.10
80	9.43	1.07
90	5.00	0.78
95	2.57	0.43
100	0.00	0.00

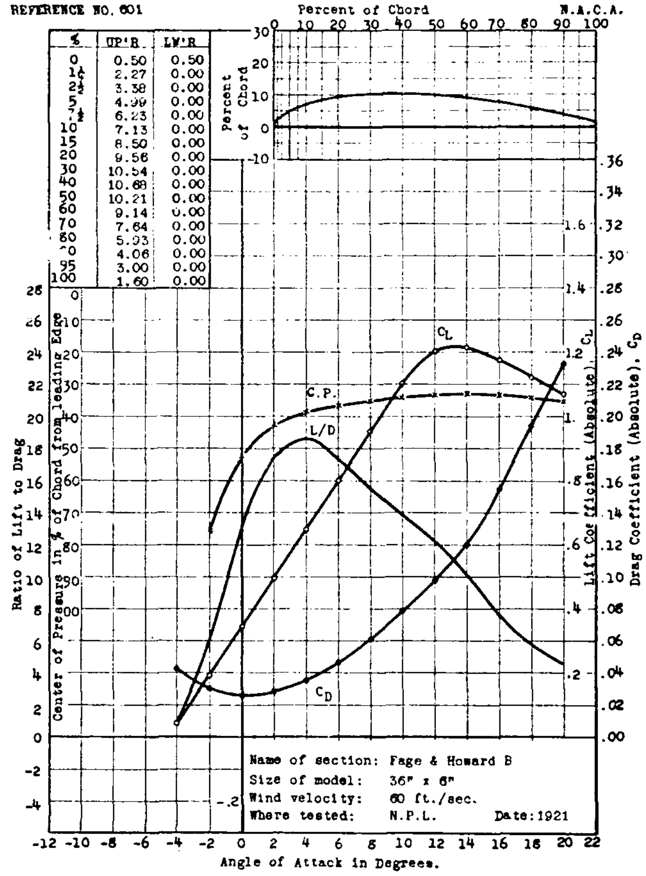
REFERENCE NO. 600

%	UP'R	LW'R
0	1.00	1.00
1¼	2.82	0.00
2½	3.75	0.00
5	4.92	0.00
7½	5.70	0.00
10	6.27	0.00
15	7.24	0.00
20	7.87	0.00
30	8.55	0.00
40	8.67	0.00
50	8.30	0.00
60	7.53	0.00
70	6.46	0.00
80	5.12	0.00
90	3.45	0.00
95	2.38	0.00
100	1.30	0.00



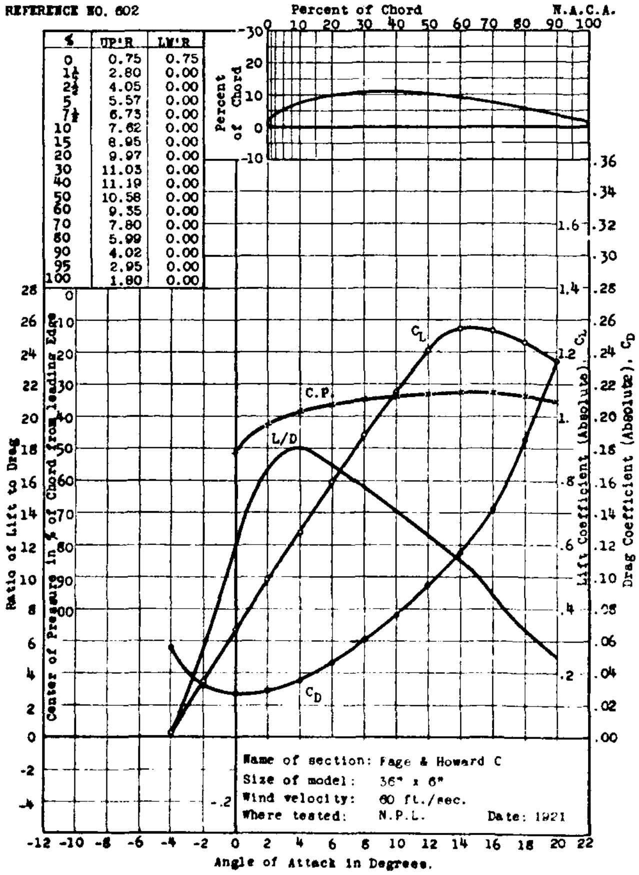
REFERENCE NO. 601

%	UP'R	LW'R
0	0.50	0.50
1¼	2.27	0.00
2½	3.38	0.00
5	4.99	0.00
7½	6.23	0.00
10	7.13	0.00
15	8.50	0.00
20	9.56	0.00
30	10.54	0.00
40	10.68	0.00
50	10.21	0.00
60	9.14	0.00
70	7.64	0.00
80	5.93	0.00
90	4.06	0.00
95	3.00	0.00
100	1.60	0.00



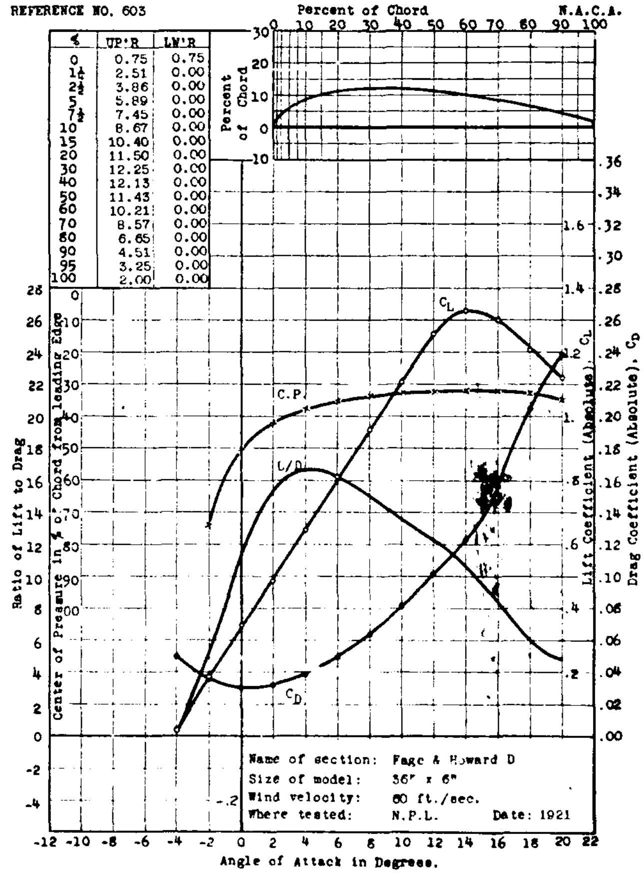
REFERENCE NO. 602

%	UP'R	LW'R
0	0.75	0.75
1¼	2.80	0.00
2½	4.05	0.00
5	5.57	0.00
7½	6.73	0.00
10	7.62	0.00
15	8.95	0.00
20	9.97	0.00
30	11.03	0.00
40	11.19	0.00
50	10.58	0.00
60	9.35	0.00
70	7.80	0.00
80	5.99	0.00
90	4.02	0.00
95	2.95	0.00
100	1.80	0.00



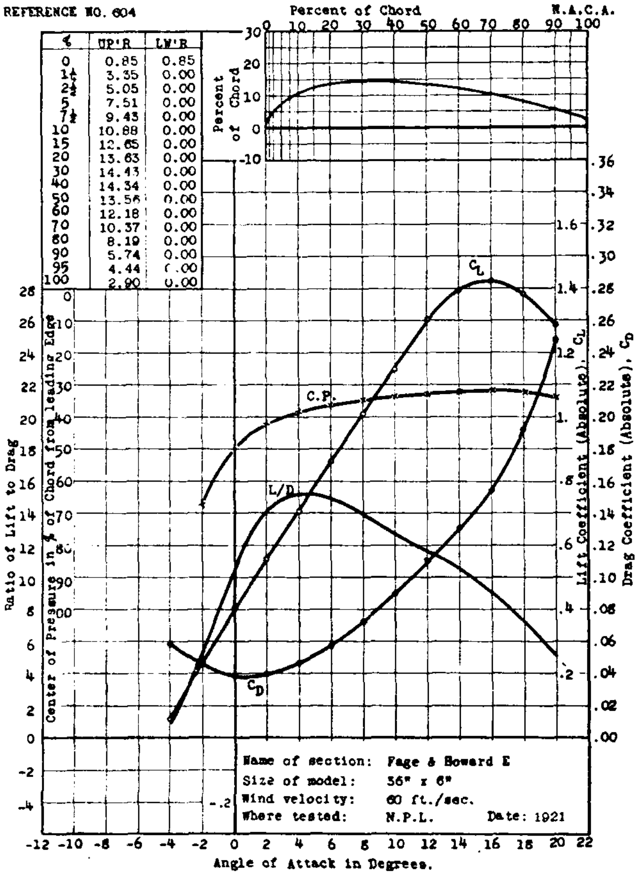
REFERENCE NO. 603

%	UP'R	LW'R
0	0.75	0.75
1¼	2.51	0.00
2½	3.86	0.00
5	5.89	0.00
7½	7.45	0.00
10	8.67	0.00
15	10.40	0.00
20	11.50	0.00
30	12.25	0.00
40	12.13	0.00
50	11.43	0.00
60	10.21	0.00
70	8.57	0.00
80	6.65	0.00
90	4.51	0.00
95	3.25	0.00
100	2.00	0.00



REFERENCE NO. 604

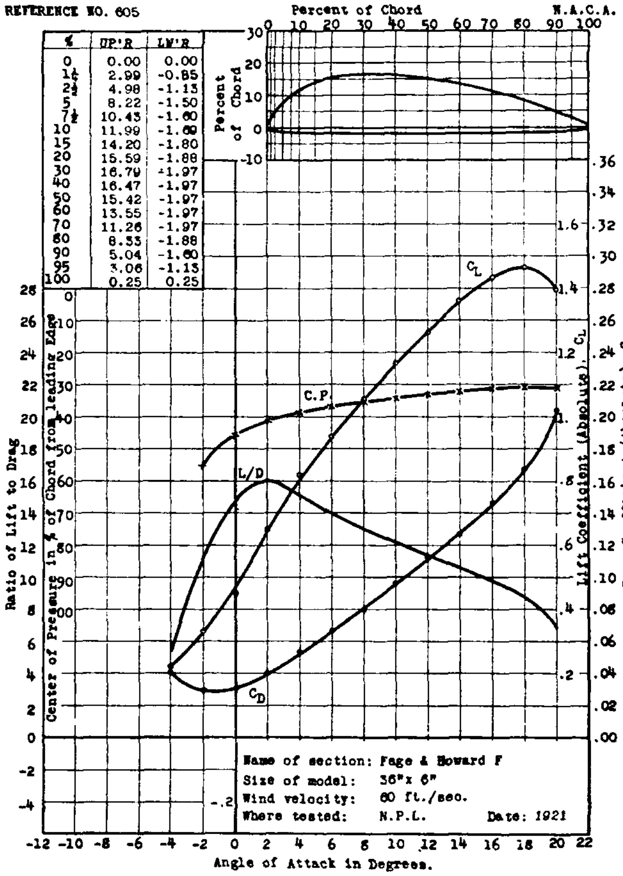
%	UP'R	LW'R
0	0.85	0.85
1¼	3.35	0.00
2½	5.05	0.00
5	7.51	0.00
7½	9.43	0.00
10	10.88	0.00
15	12.65	0.00
20	13.63	0.00
30	14.43	0.00
40	14.34	0.00
50	13.56	0.00
60	12.18	0.00
70	10.37	0.00
80	8.19	0.00
90	5.74	0.00
95	4.44	0.00
100	2.90	0.00



Name of section: Fage & Howard E
Size of model: 36" x 6"
Wind velocity: 60 ft./sec.
Where tested: N.P.L. Date: 1921

REFERENCE NO. 605

%	UP'R	LW'R
0	0.00	0.00
1¼	2.99	-0.85
2½	4.98	-1.13
5	8.22	-1.50
7½	10.43	-1.60
10	11.99	-1.69
15	14.20	-1.80
20	15.59	-1.88
30	16.79	-1.97
40	16.47	-1.97
50	15.42	-1.97
60	13.55	-1.97
70	11.26	-1.97
80	8.33	-1.88
90	5.04	-1.60
95	3.06	-1.13
100	0.25	0.25

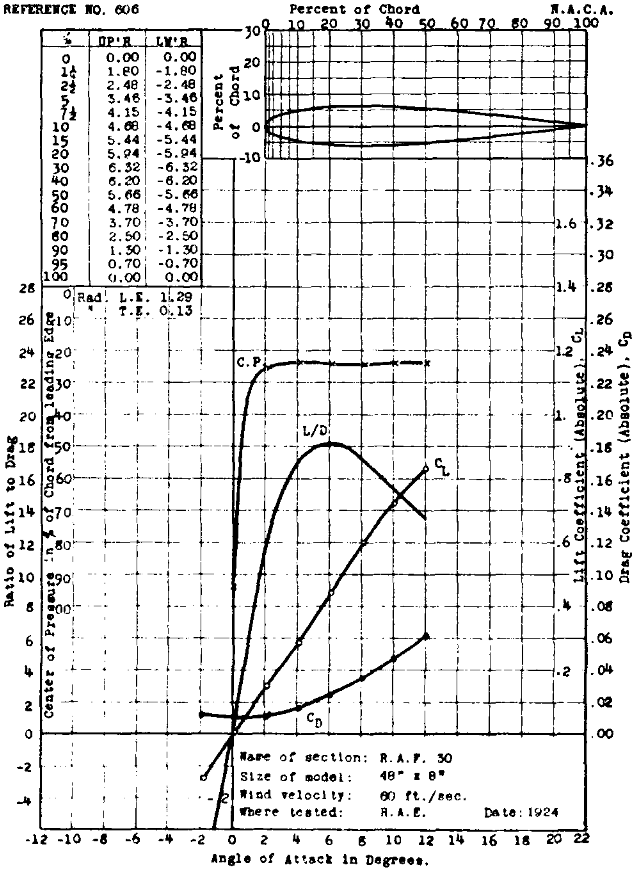


Name of section: Fage & Howard F
Size of model: 36" x 6"
Wind velocity: 60 ft./sec.
Where tested: N.P.L. Date: 1921

REFERENCE NO. 606

%	UP'R	LW'R
0	0.00	0.00
1¼	1.80	-1.80
2½	2.48	-2.48
5	3.46	-3.46
7½	4.15	-4.15
10	4.68	-4.68
15	5.44	-5.44
20	5.94	-5.94
30	6.32	-6.32
40	6.20	-6.20
50	5.66	-5.66
60	4.78	-4.78
70	3.70	-3.70
80	2.50	-2.50
90	1.30	-1.30
95	0.70	-0.70
100	0.00	0.00

Rad. L.E. 1.29
" T.E. 0.13

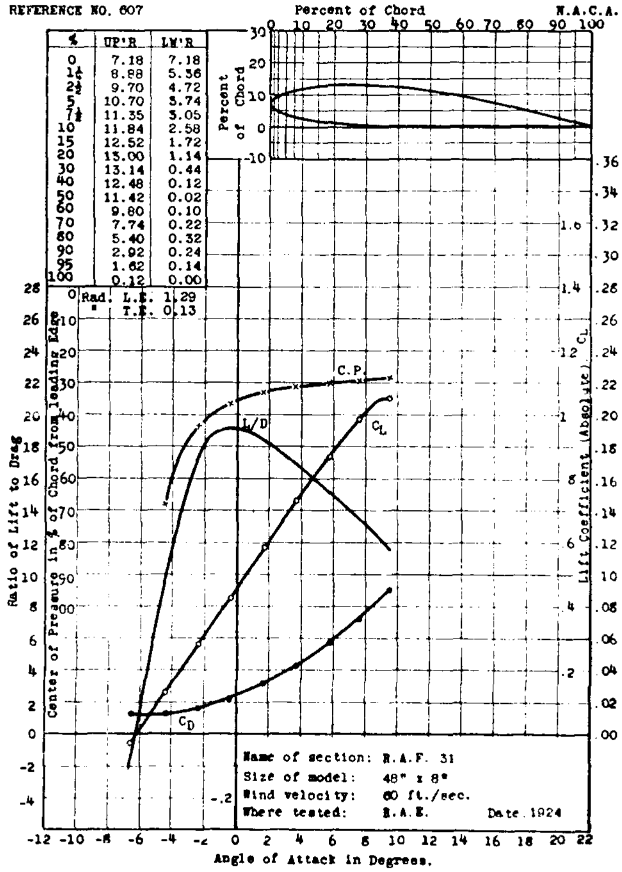


Name of section: R.A.F. 30
Size of model: 48" x 8"
Wind velocity: 60 ft./sec.
Where tested: R.A.E. Date: 1924

REFERENCE NO. 607

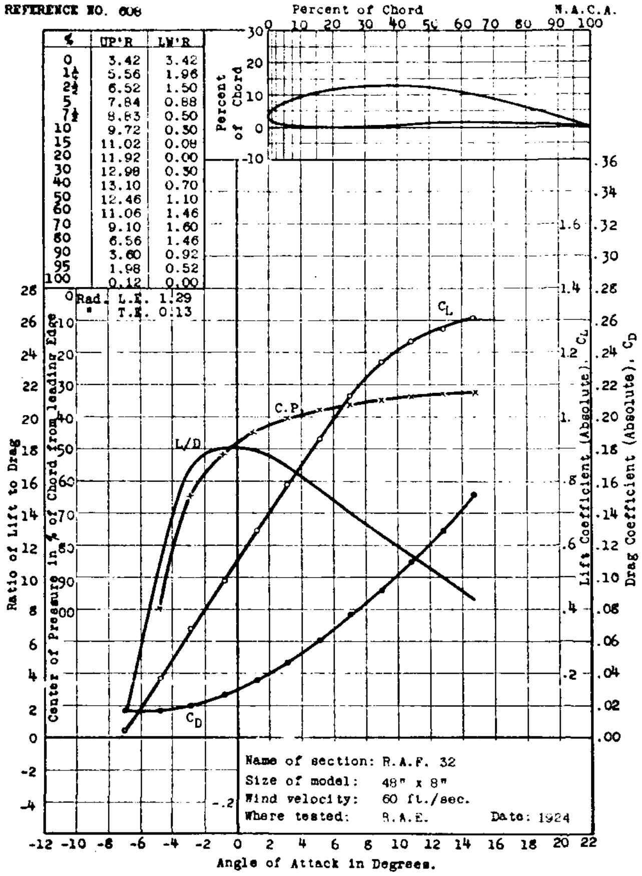
%	UP'R	LW'R
0	7.18	7.18
1¼	8.88	5.36
2½	9.70	4.72
5	10.70	3.74
7½	11.35	3.05
10	11.84	2.58
15	12.52	1.72
20	13.00	1.14
30	13.14	0.44
40	12.48	0.12
50	11.42	0.02
60	9.80	0.10
70	7.74	0.22
80	5.40	0.32
90	2.92	0.24
95	1.62	0.14
100	0.12	0.00

Rad. L.E. 1.29
" T.E. 0.13



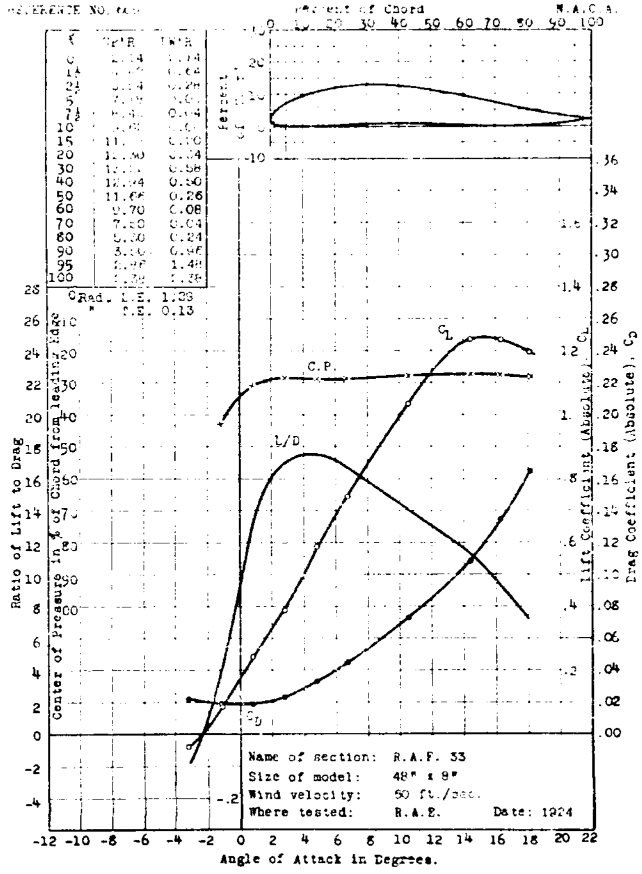
Name of section: R.A.F. 31
Size of model: 48" x 8"
Wind velocity: 60 ft./sec.
Where tested: R.A.E. Date 1924

REFERENCE NO. 608



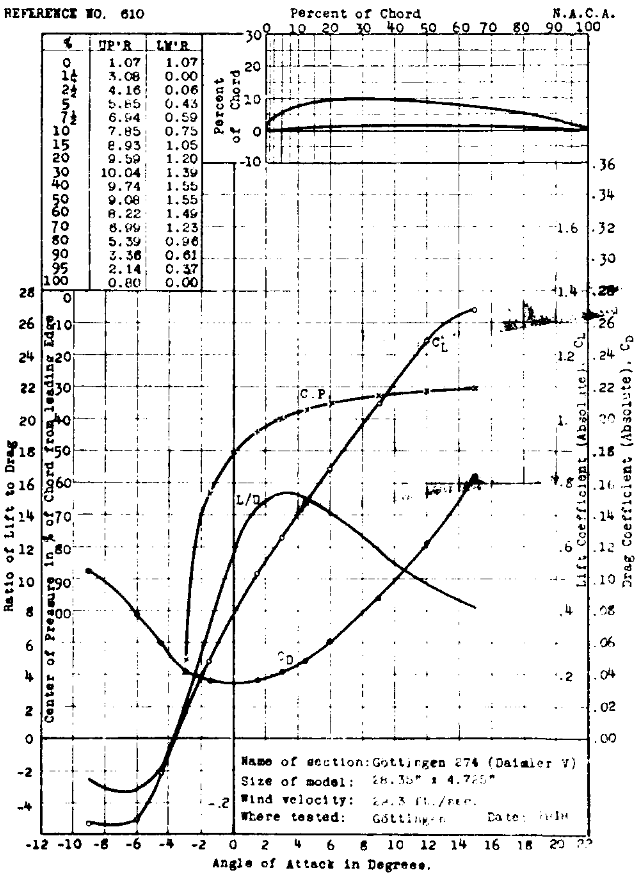
%	UP'R	LW'R
0	3.42	3.42
1¼	5.56	1.96
2½	6.52	1.50
5	7.84	0.88
7½	8.83	0.50
10	9.72	0.30
15	11.02	0.08
20	11.92	0.00
30	12.98	0.30
40	13.10	0.70
50	12.46	1.10
60	11.06	1.46
70	9.10	1.60
80	6.56	1.46
90	3.60	0.92
95	1.98	0.52
100	0.12	0.00

REFERENCE NO. [illegible]



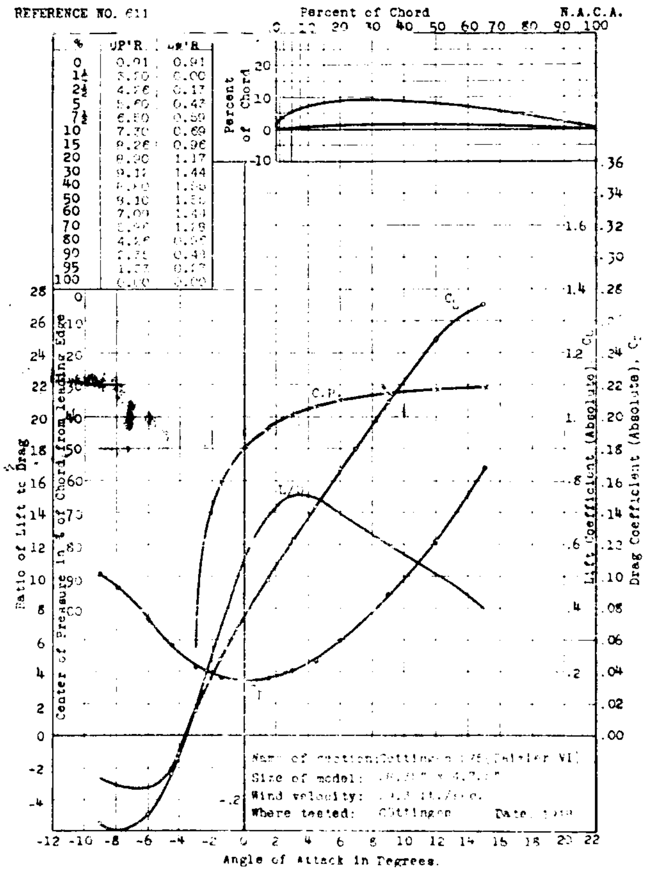
%	UP'R	LW'R
0	[illegible]	[illegible]
1¼	[illegible]	0.64
2½	[illegible]	0.28
5	[illegible]	[illegible]
7½	[illegible]	[illegible]
10	[illegible]	[illegible]
15	[illegible]	[illegible]
20	[illegible]	[illegible]
30	[illegible]	0.58
40	[illegible]	0.50
50	11.66	0.26
60	9.70	0.08
70	7.50	0.04
80	[illegible]	0.24
90	[illegible]	[illegible]
95	[illegible]	1.48
100	[illegible]	[illegible]

REFERENCE NO. 610



%	UP'R	LW'R
0	1.07	1.07
1¼	3.08	0.00
2½	4.16	0.06
5	5.85	0.43
7½	6.94	0.59
10	7.85	0.75
15	8.93	1.05
20	9.59	1.20
30	10.04	1.39
40	9.74	1.55
50	9.08	1.55
60	8.22	1.49
70	6.99	1.23
80	5.39	0.96
90	3.38	0.61
95	2.14	0.37
100	0.80	0.00

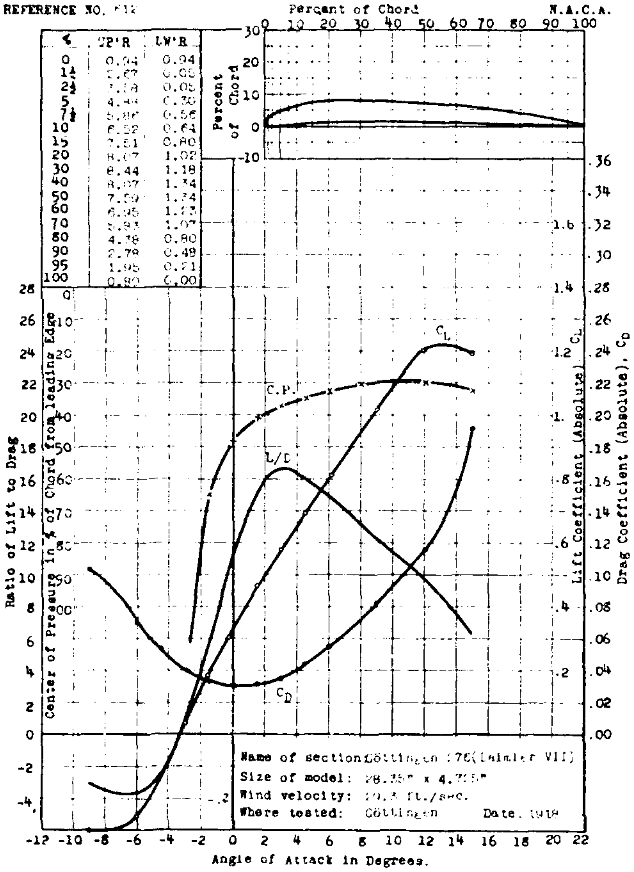
REFERENCE NO. 611



%	UP'R	LW'R
0	[illegible]	0.91
1¼	[illegible]	[illegible]
2½	[illegible]	0.17
5	[illegible]	[illegible]
7½	[illegible]	[illegible]
10	[illegible]	0.69
15	[illegible]	0.96
20	[illegible]	1.17
30	[illegible]	1.44
40	[illegible]	[illegible]
50	9.10	[illegible]
60	[illegible]	[illegible]
70	[illegible]	[illegible]
80	[illegible]	[illegible]
90	[illegible]	[illegible]
95	[illegible]	[illegible]
100	[illegible]	[illegible]

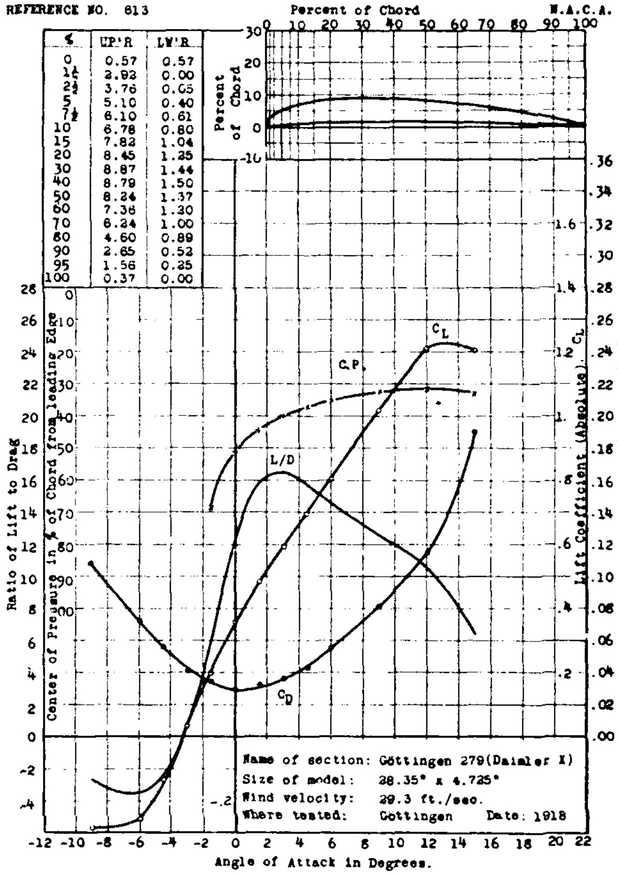
REFERENCE NO. 612

%	UP'R	LW'R
0	0.94	0.94
1¼	[illegible]	[illegible]
2½	[illegible]	0.05
5	[illegible]	0.30
7½	5.86	0.56
10	6.52	0.64
15	7.51	0.80
20	8.07	1.02
30	8.44	1.18
40	8.07	1.34
50	7.59	1.74
60	6.95	[illegible]
70	5.93	1.07
80	4.78	0.80
90	2.78	0.48
95	1.95	0.21
100	0.80	0.00



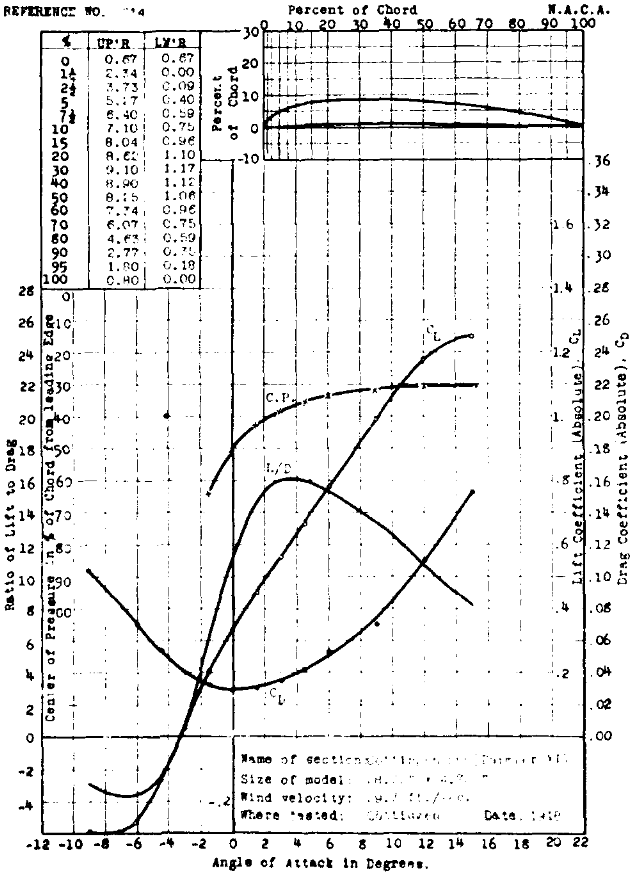
REFERENCE NO. 613

%	UP'R	LW'R
0	0.57	0.57
1¼	2.83	0.00
2½	3.76	0.05
5	5.10	0.40
7½	6.10	0.61
10	6.78	0.80
15	7.82	1.04
20	8.45	1.25
30	8.87	1.44
40	8.79	1.50
50	8.24	1.37
60	7.36	1.30
70	6.24	1.00
80	4.60	0.89
90	2.65	0.52
95	1.56	0.25
100	0.37	0.00



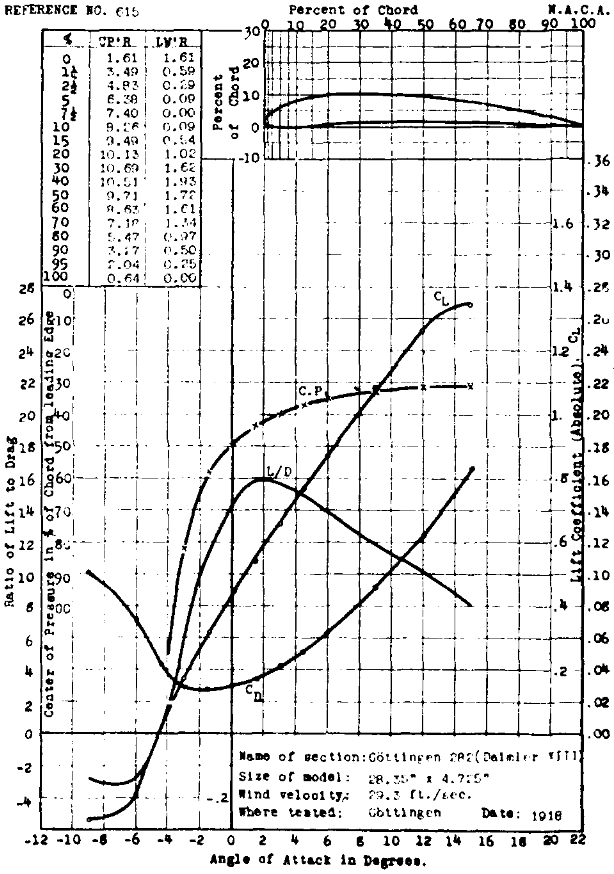
REFERENCE NO. 614

%	UP'R	LW'R
0	0.67	0.67
1¼	2.34	0.00
2½	3.73	0.09
5	[illegible]	0.40
7½	6.40	0.59
10	7.10	0.75
15	8.04	0.96
20	8.62	1.10
30	9.10	1.17
40	8.90	1.12
50	[illegible]	1.06
60	7.74	0.96
70	6.07	0.75
80	4.63	0.59
90	2.77	[illegible]
95	1.80	0.18
100	0.80	0.00

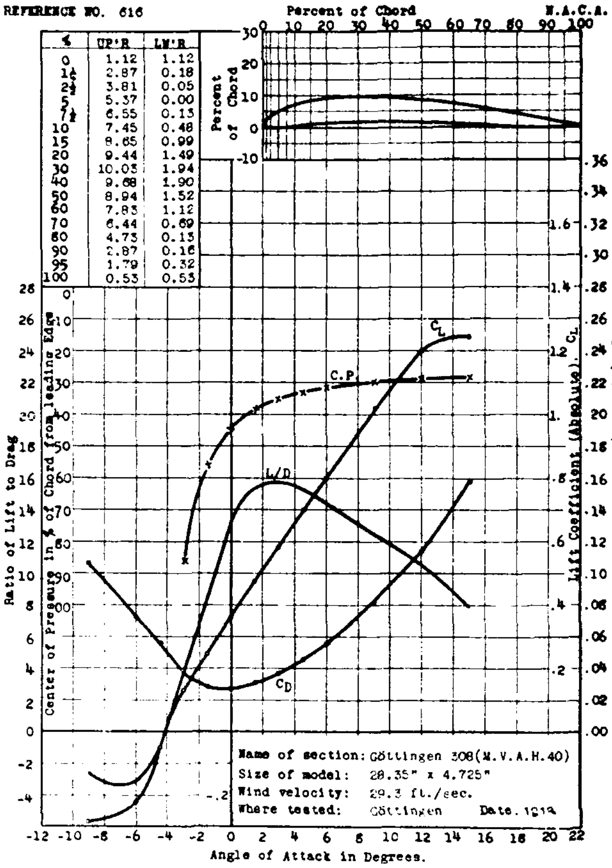


REFERENCE NO. 615

%	UP'R	LW'R
0	1.61	1.61
1¼	3.49	0.59
2½	4.83	0.29
5	6.38	0.09
7½	7.40	0.00
10	[illegible]	0.09
15	9.49	[illegible]
20	10.13	1.02
30	10.69	1.62
40	10.51	1.93
50	9.71	1.72
60	8.63	1.61
70	[illegible]	1.34
80	5.47	0.97
90	[illegible]	0.50
95	2.04	0.25
100	0.64	0.00



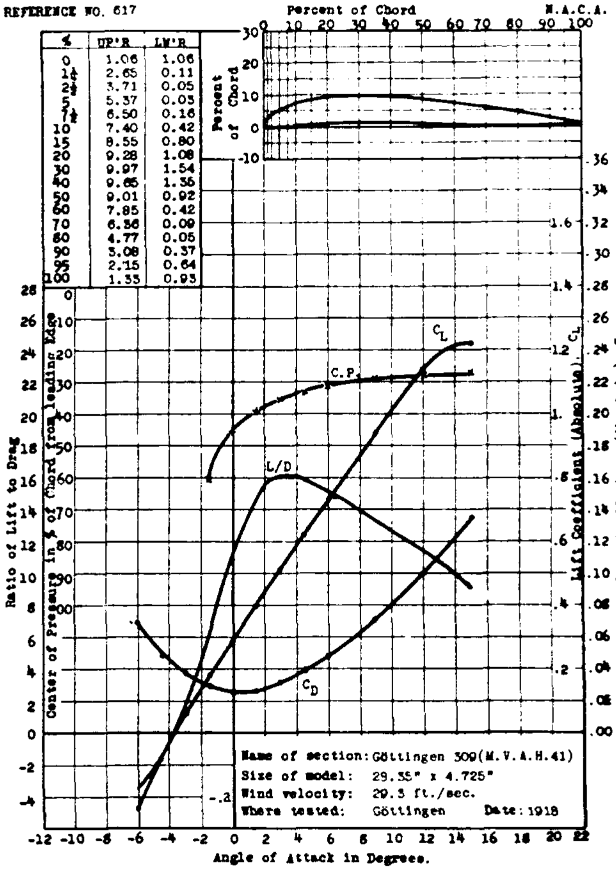
REFERENCE NO. 616



%	UP'R	LW'R
0	1.12	1.12
1¼	2.87	0.18
2½	3.81	0.05
5	5.37	0.00
7½	6.55	0.13
10	7.45	0.48
15	8.65	0.99
20	9.44	1.49
30	10.03	1.94
40	9.68	1.90
50	8.94	1.52
60	7.83	1.12
70	6.44	0.69
80	4.73	0.13
90	2.87	0.16
95	1.79	0.32
100	0.53	0.53

Name of section: Göttingen 308 (M.V.A.H.40)
Size of model: 28.35" x 4.725"
Wind velocity: 29.3 ft./sec.
Where tested: Göttingen **Date:** 1918

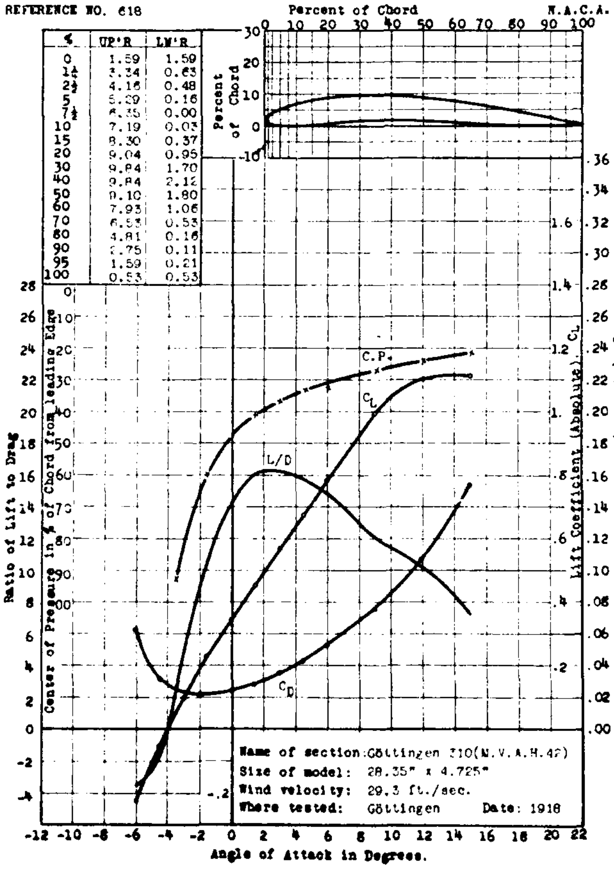
REFERENCE NO. 617



%	UP'R	LW'R
0	1.06	1.06
1¼	2.65	0.11
2½	3.71	0.05
5	5.37	0.03
7½	6.50	0.16
10	7.40	0.42
15	8.55	0.80
20	9.28	1.08
30	9.97	1.54
40	9.65	1.36
50	9.01	0.92
60	7.85	0.42
70	6.36	0.09
80	4.77	0.05
90	3.08	0.37
95	2.15	0.64
100	1.33	0.93

Name of section: Göttingen 309 (M.V.A.H.41)
Size of model: 29.35" x 4.725"
Wind velocity: 29.3 ft./sec.
Where tested: Göttingen **Date:** 1918

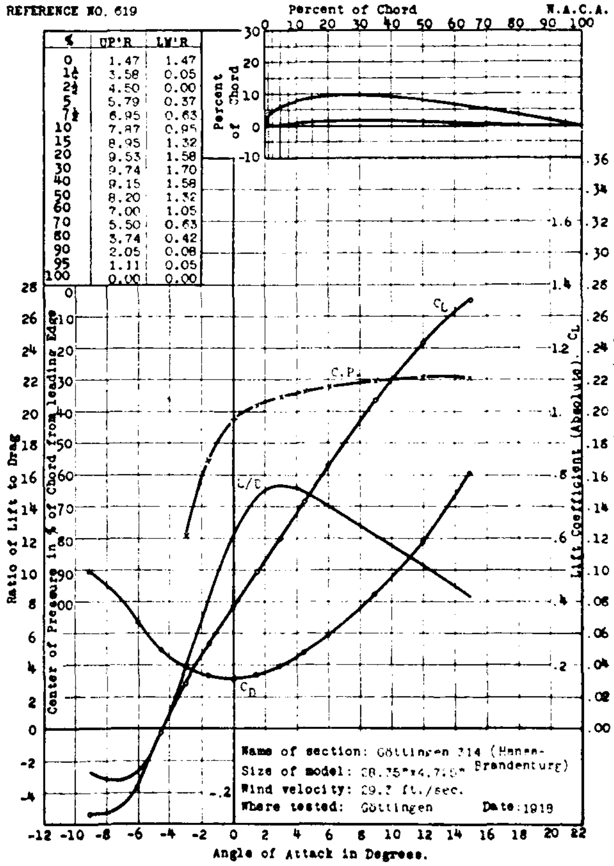
REFERENCE NO. 618



%	UP'R	LW'R
0	1.59	1.59
1¼	3.34	0.63
2½	4.16	0.48
5	5.29	0.16
7½	6.35	0.00
10	7.19	0.03
15	8.30	0.37
20	9.04	0.95
30	9.84	1.70
40	9.84	2.12
50	9.10	1.80
60	7.93	1.06
70	6.53	0.53
80	4.81	0.16
90	2.75	0.11
95	1.59	0.21
100	0.53	0.53

Name of section: Göttingen 310 (M.V.A.H.42)
Size of model: 28.35" x 4.725"
Wind velocity: 29.3 ft./sec.
Where tested: Göttingen **Date:** 1918

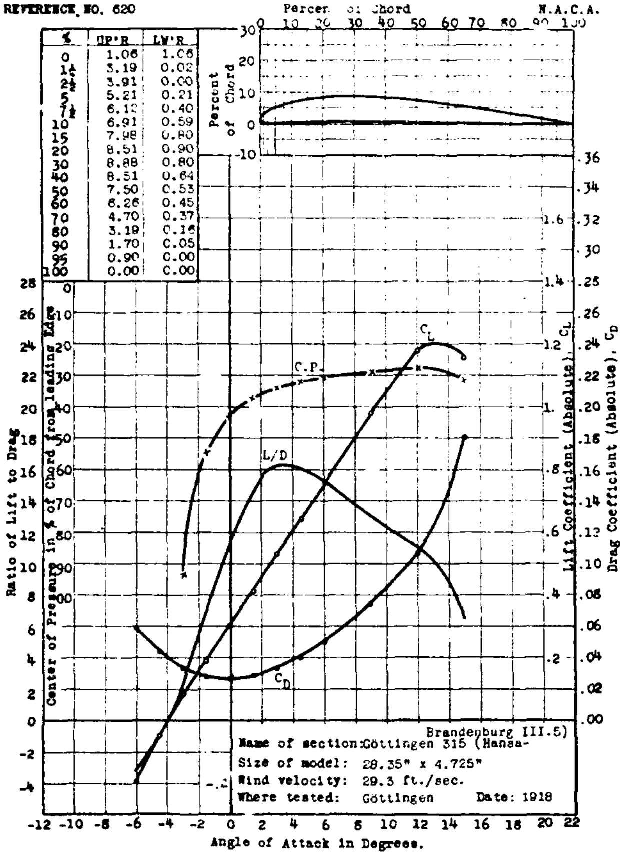
REFERENCE NO. 619



%	UP'R	LW'R
0	1.47	1.47
1¼	3.58	0.05
2½	4.50	0.00
5	5.79	0.37
7½	6.95	0.63
10	7.87	0.95
15	8.95	1.32
20	9.53	1.58
30	9.74	1.70
40	9.15	1.58
50	8.20	1.32
60	7.00	1.05
70	5.50	0.63
80	3.74	0.42
90	2.05	0.08
95	1.11	0.05
100	0.00	0.00

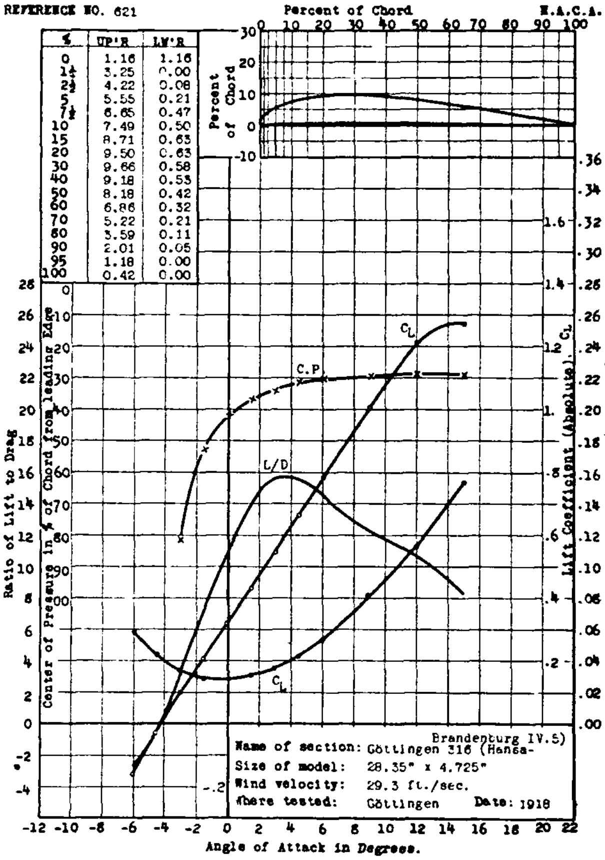
Name of section: Göttingen 314 (Hansa-Brandenburg)
Size of model: 28.75"x4.725"
Wind velocity: 29.3 ft./sec.
Where tested: Göttingen **Date:** 1918

REFERENCE NO. 620



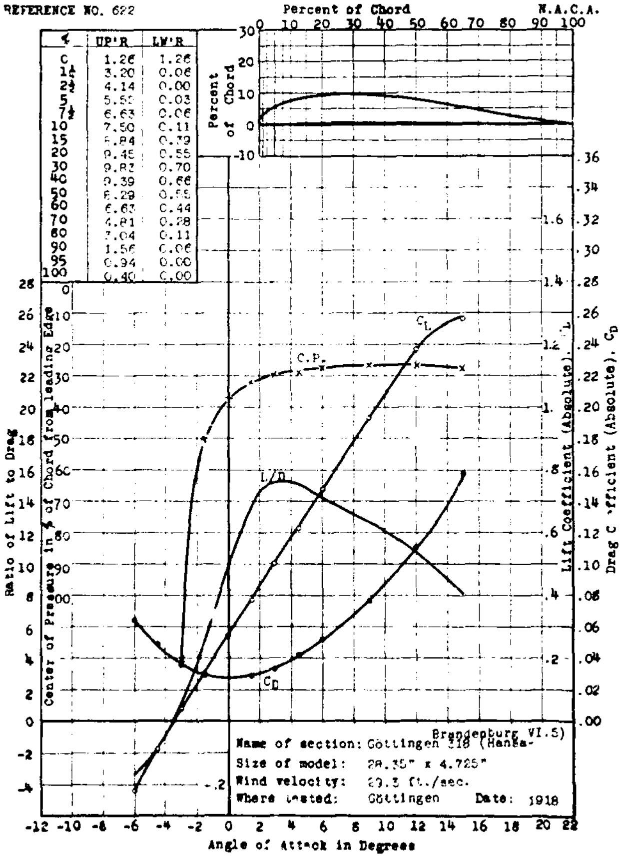
%	UP'R	LW'R
0	1.06	1.06
1¼	3.19	0.02
2½	3.91	0.00
5	5.21	0.21
7½	6.12	0.40
10	6.91	0.59
15	7.98	0.80
20	8.51	0.90
30	8.88	0.80
40	8.51	0.64
50	7.50	0.53
60	6.26	0.45
70	4.70	0.37
80	3.19	0.16
90	1.70	0.05
95	0.90	0.00
100	0.00	0.00

REFERENCE NO. 621



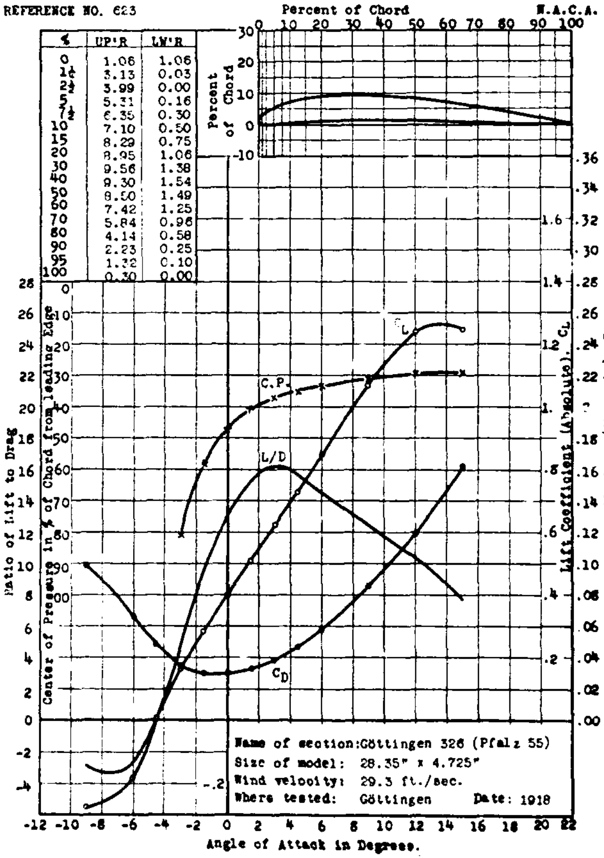
%	UP'R	LW'R
0	1.16	1.16
1¼	3.25	0.00
2½	4.22	0.08
5	5.55	0.21
7½	6.65	0.47
10	7.49	0.50
15	8.71	0.63
20	9.50	0.63
30	9.66	0.58
40	9.18	0.53
50	8.18	0.42
60	6.86	0.32
70	5.22	0.21
80	3.59	0.11
90	2.01	0.05
95	1.18	0.00
100	0.42	0.00

REFERENCE NO. 622



%	UP'R	LW'R
0	1.26	1.26
1¼	3.20	0.06
2½	4.14	0.00
5	5.52	0.03
7½	6.63	0.06
10	7.50	0.11
15	8.84	0.39
20	9.45	0.55
30	9.83	0.70
40	9.39	0.66
50	8.29	0.55
60	6.63	0.44
70	4.81	0.28
80	3.04	0.11
90	1.56	0.06
95	0.94	0.00
100	0.40	0.00

REFERENCE NO. 623



%	UP'R	LW'R
0	1.06	1.06
1¼	3.13	0.03
2½	3.99	0.00
5	5.31	0.16
7½	6.35	0.30
10	7.10	0.50
15	8.29	0.75
20	8.95	1.06
30	9.56	1.38
40	9.30	1.54
50	8.50	1.49
60	7.42	1.25
70	5.84	0.96
80	4.14	0.58
90	2.23	0.25
95	1.32	0.10
100	0.30	0.00

TABLE OF ORDINATES NOT GIVEN ON INDIVIDUAL CHARACTERISTIC SHEETS

[Ordinates for dotted section at tip where ratio of ordinate to chord differs from that of section at center of span]

Stations in per cent of chord	Ref. 545 Göttingen 387 (tapered)		Ref. 548 Dayton Wright T-1 (tapered)		Ref. 574 R-3		Ref. 575 Glenn Martin 2 (modified)		Ref. 578 U. S. A. 35		Ref. 580 U. S. A. 45	
	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
0	2. 55	2. 55	2. 04	2. 04	0. 64	0. 64	1. 39	1. 39	2. 76	2. 76	0. 98	0. 98
1.25	4. 43	1. 07	3. 25	1. 08	1. 39	. 00	3. 35	. 50	5. 14	1. 03	2. 40	. 15
2.50	5. 37	. 70	3. 79	. 79	1. 86	−. 21	4. 49	. 29	6. 09	. 61	3. 12	−. 13
5	6. 70	. 42	4. 60	. 42	2. 67	−. 51	6. 20	. 04	7. 53	. 27	4. 44	−. 42
7.50	7. 53	. 23	5. 25	. 21	3. 22	−. 79	7. 35	. 01	8. 64	. 14	5. 35	−. 65
10	8. 20	. 12	5. 74	. 10	3. 75	−1. 00	8. 41	. 00	9. 46	. 06	6. 12	−. 77
15	9. 15	. 03	6. 46	. 00	4. 40	−1. 35	9. 70	. 06	10. 56	. 00	7. 21	−. 98
20	9. 75	. 00	6. 87	. 05	4. 80	−1. 66	10. 40	. 18	11. 27	. 05	7. 69	−1. 08
30	10. 10	. 03	7. 08	. 21	5. 27	−2. 04	10. 69	1. 00	11. 72	. 16	7. 58	−1. 25
40	9. 73	. 17	6. 91	. 40	5. 27	−2. 04	10. 29	. 85	11. 36	. 28	6. 89	−1. 21
50	8. 83	. 32	6. 45	. 37	5. 00	−2. 00	9. 69	. 71	10. 28	. 38	6. 12	−1. 21
60	7. 59	. 38	5. 66	. 21	4. 46	−1. 87	8. 52	. 29	8. 85	. 43	5. 04	−1. 08
70	6. 00	. 37	4. 66	. 04	3. 68	−1. 46	7. 10	. 04	7. 07	. 41	3. 90	−. 90
80	4. 30	. 33	3. 42	. 00	2. 86	−1. 00	5. 31	. 00	5. 00	. 35	2. 71	−. 65
90	2. 37	. 18	1. 96	. 06	1. 86	− . 57	3. 21	. 11	2. 76	. 21	1. 38	−. 35
95	1. 30	. 10	1. 12	. 12	1. 34	− . 07	2. 00	. 15	1. 52	. 12	. 75	−. 19
100	. 13	. 00	. 29	. 21	. 45	. 45	. 61	. 61	. 27	. 00	. 00	. 00
Rad. L. E.											. 957	. 625

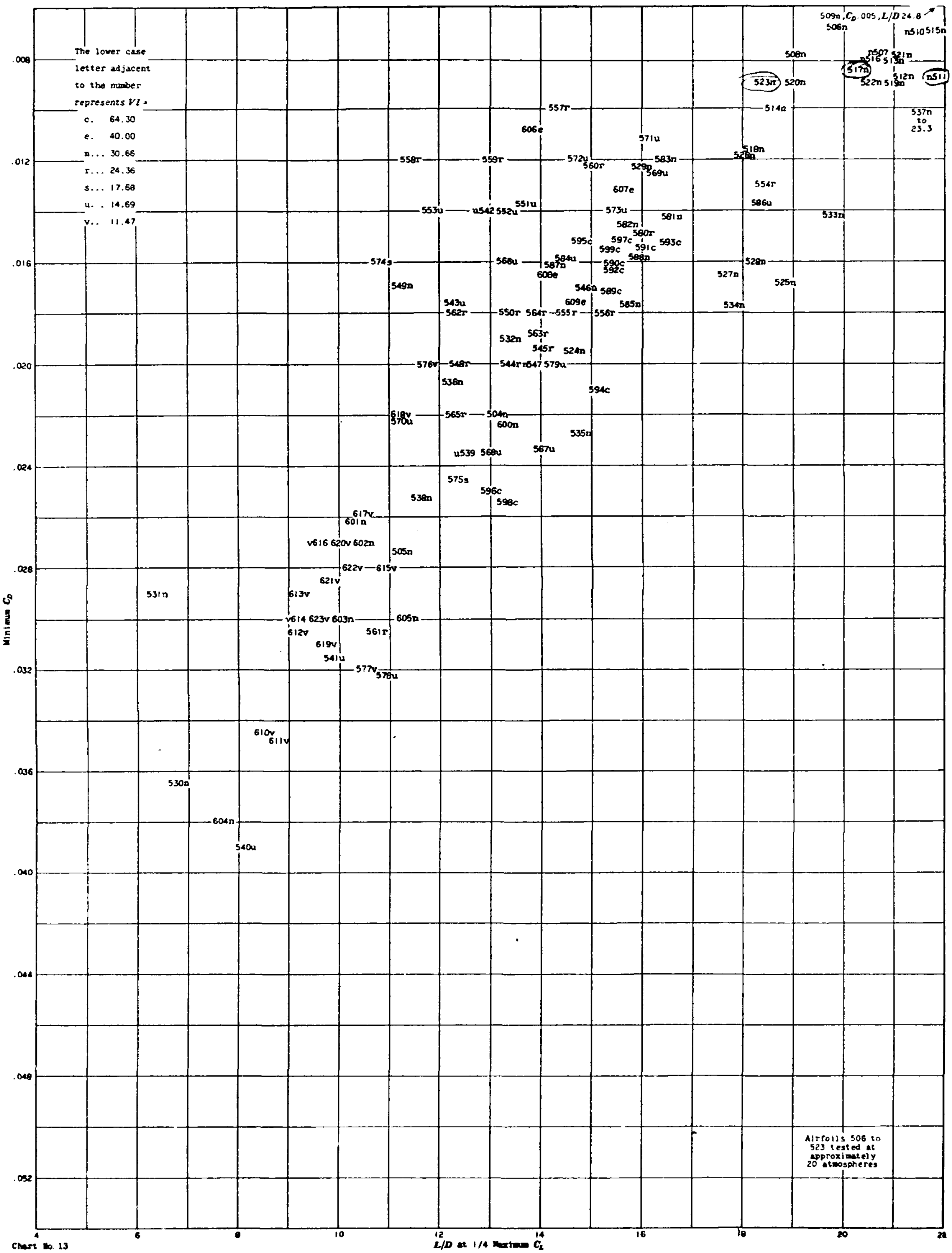
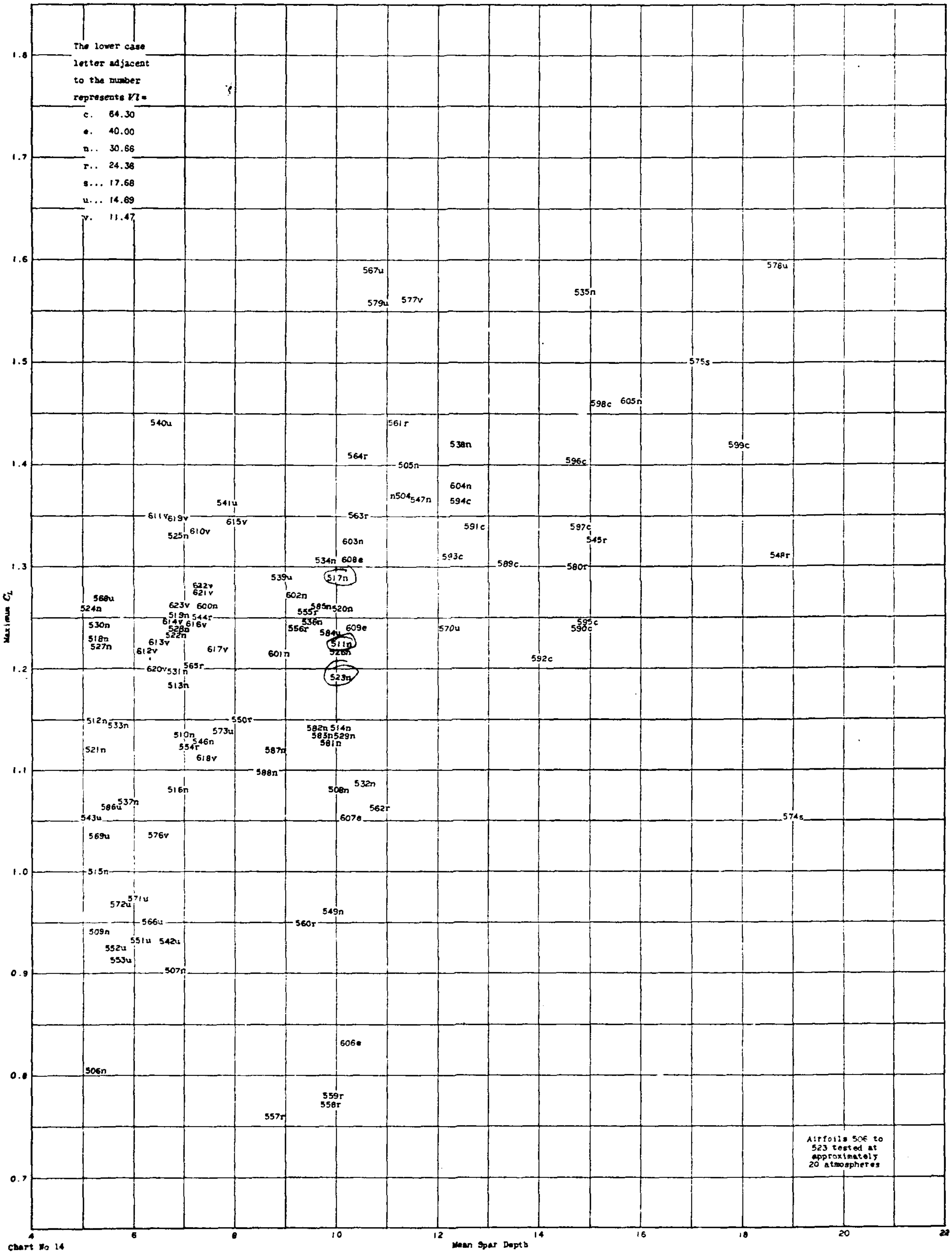

The lower case letter adjacent to the number represents VI =
c. 64.30
e. 40.00
n... 30.66
r... 24.36
s... 17.68
u.. 14.69
v.. 11.47
509n, C_D .005, L/D 24.8
537n to 23.3
Airfoils 506 to 523 tested at approximately 20 atmospheres
Minimum C_D
L/D at 1/4 Maximum C_L

Chart No. 13



The lower case letter adjacent to the number represents VI =
c. 64.30
e. 40.00
n.. 30.66
r.. 24.38
s... 17.68
u... 14.89
v. 11.47
Maximum C_L
Mean Spar Depth
4
6
8
10
12
14
16
18
20
22
0.7
0.8
0.9
1.0
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
Airfoils 506 to 523 tested at approximately 20 atmospheres

Chart No 14

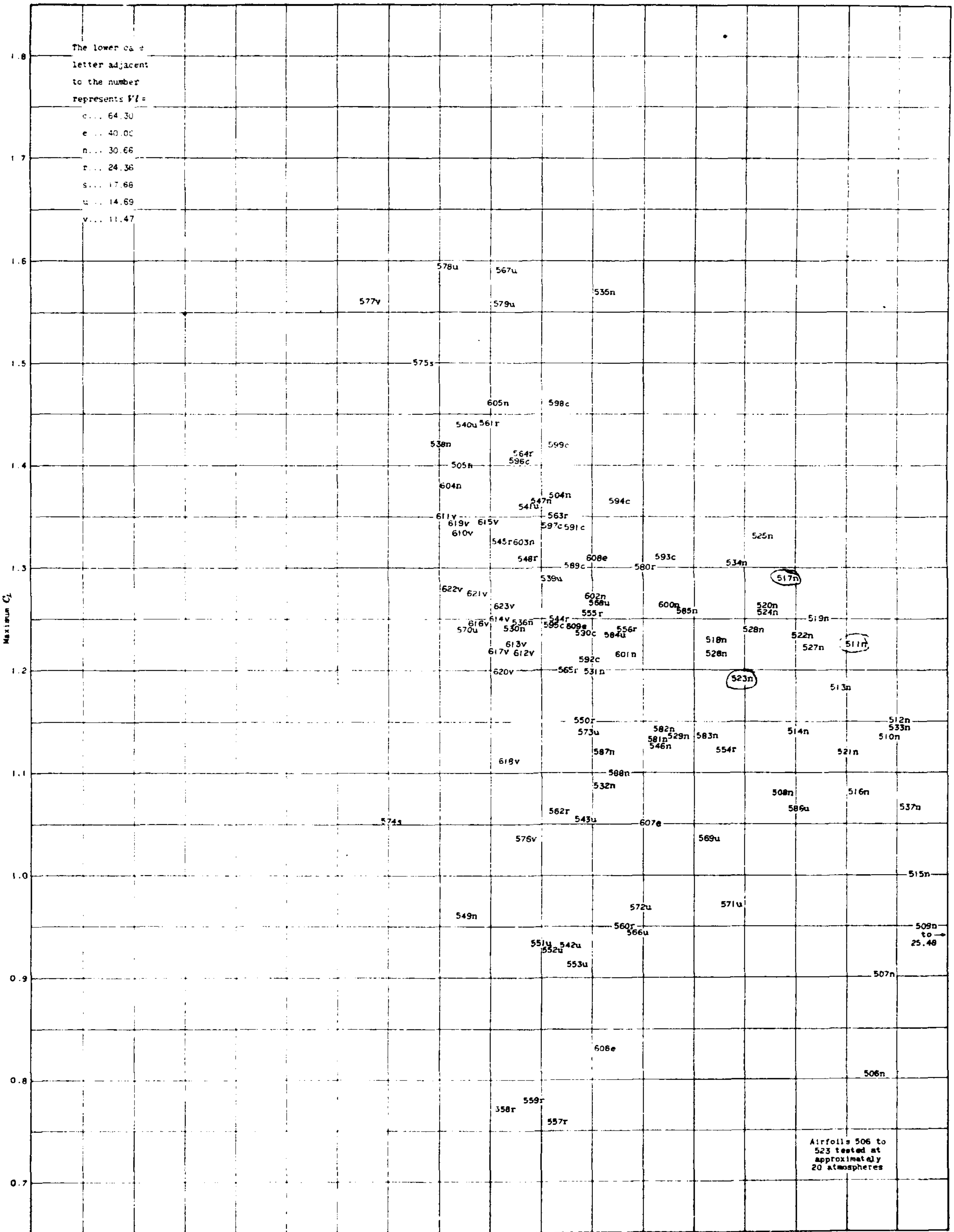

The lower case letter adjacent to the number represents Vl =
c... 64.30
e... 40.00
n... 30.66
r... 24.36
s... 17.66
u... 14.69
v... 11.47
Maximum C_L
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
8
10
12
14
16
18
20
22
24
Maximum L/D
Airfoils 506 to 523 tested at approximately 20 atmospheres

Chart No. 15

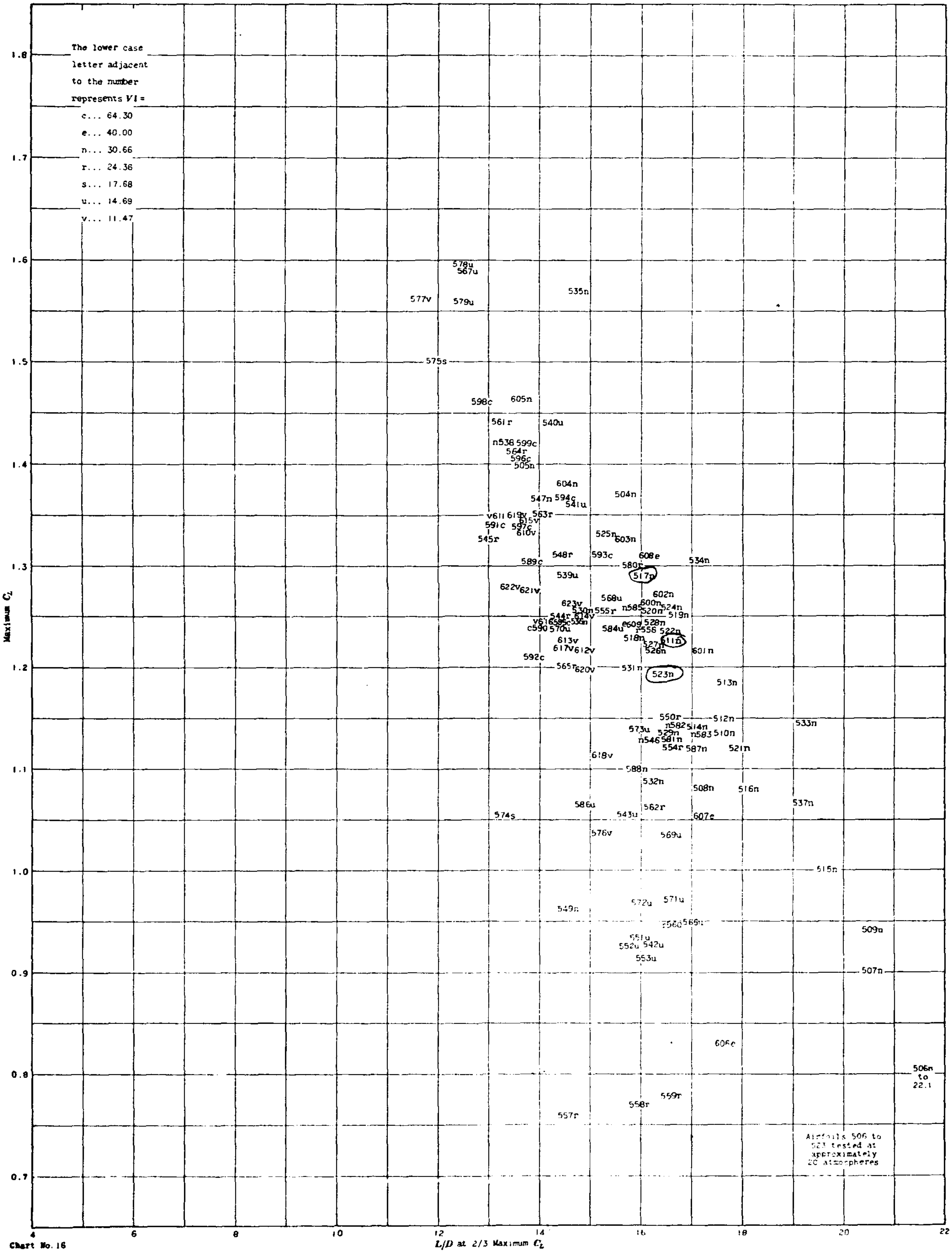
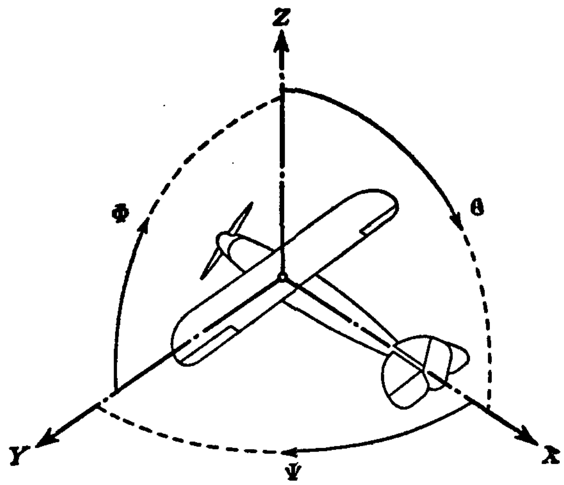

The lower case letter adjacent to the number represents VI =
c... 64.30
e... 40.00
n... 30.66
r... 24.36
s... 17.68
u... 14.69
v... 11.47
Maximum C_L
L/D at 2/3 Maximum C_L
Airfoils 506 to 523 tested at approximately 20 atmospheres
506n to 22.1

Chart No. 16



Positive directions of axes and angles (forces and moments) are shown by arrows

Axis		Force (parallel to axis) symbol	Moment about axis			Angle		Velocities	
Designation	Symbol		Designation	Symbol	Positive direction	Designation	Symbol	Linear (component along axis)	Angular
Longitudinal	X	X	rolling	L	$Y \longrightarrow Z$	roll	Φ	u	p
Lateral	Y	Y	pitching	M	$Z \longrightarrow X$	pitch	Θ	v	q
Normal	Z	Z	yawing	N	$X \longrightarrow Y$	yaw	Ψ	w	r

Absolute coefficients of moment

$$C_L=\frac{L}{qbS}\quad C_M=\frac{M}{qcS}\quad C_N=\frac{N}{qfS}$$

Angle of set of control surface (relative to neutral position), δ. (Indicate surface by proper subscript.)

4. PROPELLER SYMBOLS

D, Diameter.
p_e, Effective pitch
p_g, Mean geometric pitch.
p_s, Standard pitch.
p_v, Zero thrust.
p_a, Zero torque.
p/D, Pitch ratio.
V', Inflow velocity.
V_s, Slip stream velocity.

T, Thrust.
Q, Torque.
P, Power.
(If "coefficients" are introduced all units used must be consistent.)
η, Efficiency $= T\,V/P$.
n, Revolutions per sec., r. p. s.
N, Revolutions per minute., R. P. M.
Φ, Effective helix angle $=\tan^{-1}\left(\frac{V}{2\pi rn}\right)$

5. NUMERICAL RELATIONS

1 HP = 76.04 kg/m/sec. = 550 lb./ft./sec.
1 kg/m/sec. = 0.01315 HP.
1 mi./hr. = 0.44704 m/sec.
1 m/sec. = 2.23693 mi./hr.

1 lb. = 0.4535924277 kg.
1 kg = 2.2046224 lb.
1 mi. = 1609.35 m = 5280 ft.
1 m = 3.2808333 ft.